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NATIONAL DAM SAFETY PROGRAM. NANTICOKE CREEK WATERSHED PROJECT --ETC(U)
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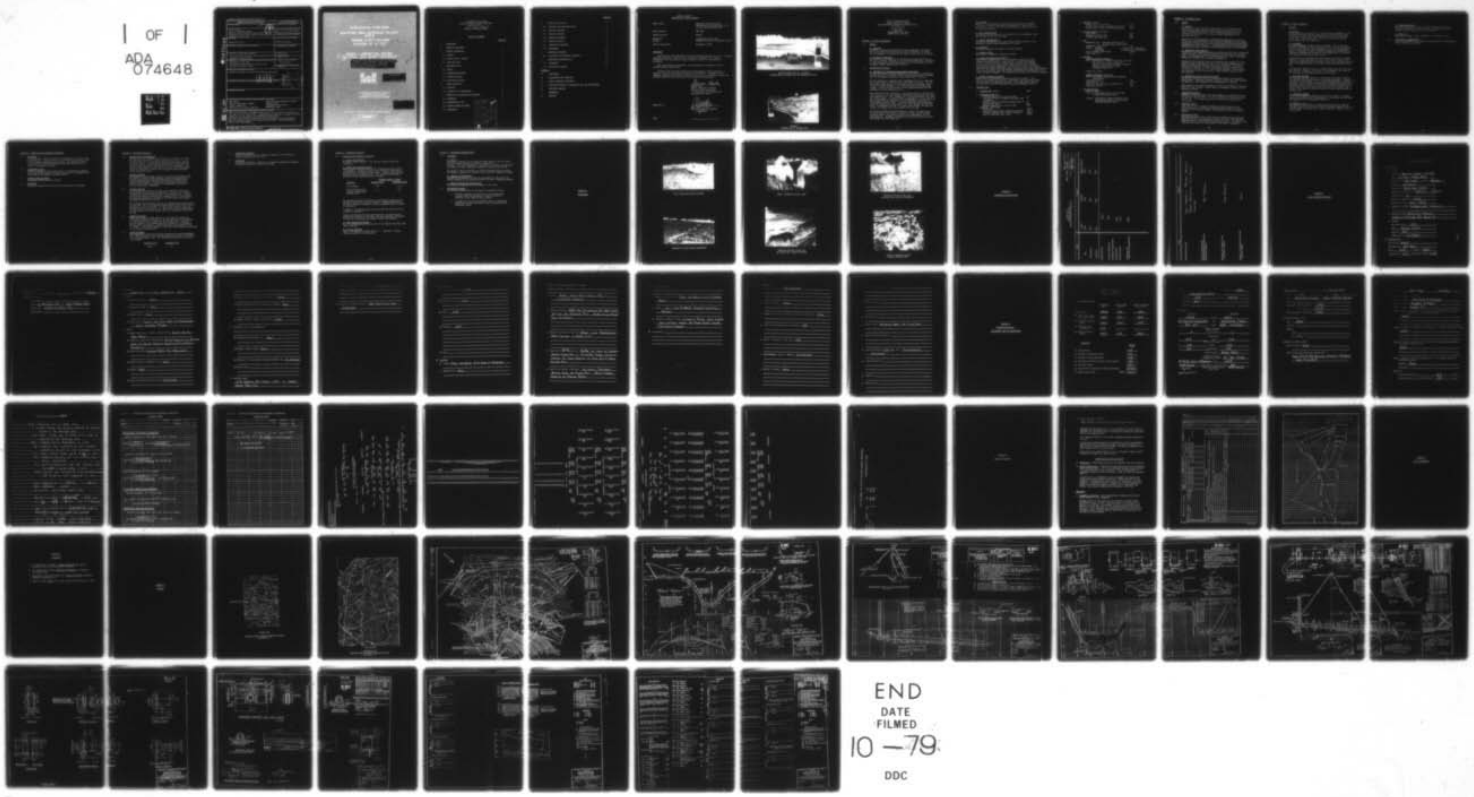

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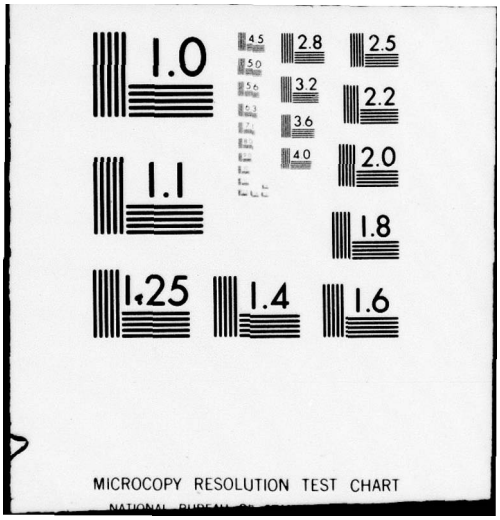
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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER	2. GOVT ACCESSION NO. 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Phase I Inspection Report Nanticoke Creek Watershed Project Site 8 Susquehanna River Basin, Broome County, New York Inventory No. N.Y. 573	5. TYPE OF REPORT & PERIOD COVERED Phase I Inspection Report National Dam Safety Program 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) George Koch, P.E.	8. CONTRACT OR GRANT NUMBER(s) DACW-51-79-C-0001
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS New York State Department of Environmental Conservation/ 50 Wolf Road Albany, New York 12233	12. REPORT DATE 17 April 1979 13. NUMBER OF PAGES
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18. SUPPLEMENTARY NOTES

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Dam Safety
National Dam Safety Program
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Nanticoke Creek Watershed Project
Broome County
Susquehanna River Basin
Nanticoke Creek

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Nanticoke Creek Watershed Protection Project Dam Site No. 8 was found to have no conditions which would render the dam unsafe. Minor maintenance actions were recommended.

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Nanticoke Creek Watershed Project Site Number 8 (Inventory Number NY-573). Susquehanna River Basin. Broome County, New York. Phase 1 Inspection Report.

(10) George /Koch

(15) DACW51-79-C-0001

(12) 74

SUSQUEHANNA RIVER BASIN
NANTICOKE CREEK WATERSHED PROTECTION
PROJECT SITE No. 8
I.D. No. NY-573 (# 85D-3645)
PHASE 1 INSPECTION REPORT

TABLE OF CONTENTS

PHASE 1 REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Nanticoke Creek Watershed Protection Project Dam Site No. 8 I.D. No. NY-573 (#85D-3645)
State Located:	New York
County Located:	Broome
Watershed:	Susquehanna River Basin
Stream:	Unnamed tributary of Nanticoke Creek
Date of Inspection:	November 8, 1978

ASSESSMENT

The Nanticoke Creek Watershed Protection Project Dam Site No. 8 is a floodwat retarding structure. Examination of available documents and a visual inspection of the dam did not reveal conditions which are considered to be unsafe.

The total discharge capability of the spillways is adequate for the Probable Maximum Flood (PMF).

To assure the continued satisfactory performance of this structure, a schedule of periodic maintenance should be established. Included in this schedule should be items such as mowing the grass on the embankment slopes and periodic operation and lubrication of the slide gate mechanism.

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

Approved By:

Col. Clark H. Benn
New York District Engineer
17 April 79

Date:

NANTICOKE CREEK SITE No. 8 OVERVIEW
NORTHERN END OF UPSTREAM FACE AND EMERGENCY SPILLWAY

OVERVIEW
SOUTHERN END OF UPSTREAM FACE

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NANTICOKE CREEK WATERSHED PROTECTION PROJECT
DAM SITE No. 8
I.D. No. NY 573
(#85D-3645)
SUSQUEHANNA RIVER BASIN
BROOME COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase 1 Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of the Dam and Appurtenant Structures

The Nanticoke Creek Watershed Protection Project Dam No. 8 consists of an earth dam with a principle spillway pipe passing through the embankment and an emergency spillway on the northern end of the dam.

The dam consists of a compacted earth embankment which is 41 feet high, has a crest length of 460 feet and a crest width of 16 feet. The upstream slope is 1 vertical on 3 horizontal and the downstream slope is 1 vertical on 2 1/2 horizontal. The crest and exposed slopes are grass covered. An earth cutoff trench of varying depth and width keys the embankment into the foundation soils.

The principle spillway consists of a two stage reinforced concrete drop inlet structure, a 24 inch diameter reinforced concrete water pipe with anti-seepage collars, and a plunge pool to dissipate energy at the outlet end of the conduit. A reservoir drain consisting of a 12 inch cast iron pipe extends from the upstream toe of the embankment to the base of the principle spillway riser. A vertical slide gate mechanism mounted along the inside of the riser controls the flow through the reservoir drain. The emergency spillway is a grass lined channel, 180 feet wide, located in an earth cut on the northern end of the dam.

An internal drainage system consisting of a gravel and sand filter with perforated 8 inch diameter bituminous coated, corrugated metal collector pipes is located at the base of the embankment near the downstream toe. Seepage is collected and conducted through this drain and outleted into the plunge pool.

b. Location

Dam No. 8 of the Nanticoke Creek Project is located on an unnamed tributary of the Nanticoke Creek, approximately 7.5 miles north of the Village of Maine. The site is off Howland Hill Road in the Town of Nanticoke, New York.

c. Size Classification

This dam is 41 feet high and is classified as an "intermediate" size dam (between 40 and 100 feet high).

d. Hazard Classification

The dam is classified in the "high" hazard category because of the presence of several homes downstream of the dam.

e. Ownership

This dam is owned by the County of Broome, New York.

f. Purpose of Dam

This dam is a floodwater retarding structure.

g. Design and Construction History

This dam was designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS). Construction of the dam was completed in 1970. The SCS Office for Broome County, located at the Broome County Airport, has a design folder containing hydrologic, hydraulic, and structural design information, and the as-built plans and documents. Since the only modification made during construction was a minor one resulting from the rock surface under the spillway being deeper than anticipated, the plans included in Appendix F are essentially the same as the as-built drawings.

h. Normal Operating Procedures

Normal flows are discharged through the principle spillway. This structure has sufficient capacity to discharge a 100 year flood without flow occuring in the emergency spillway. For storms greater than the 100 year flood, flow will discharge through the emergency spillway.

1.3 PERTINENT DATA

a. Drainage Area (acres)	1382
b. Discharge at Dam (cfs)	
Principle Spillway W.S. at top of dam	70
Principle Spillway at Emergency Spillway Crest Elevation	66
Reservoir Drain at Principle Spillway Crest El.	18
Maximum Known Flood	61
Emergency spillway W.S. at top of dam	8280
c. Elevation (USGS datum)	
Top of Dam	1258.2
Emergency Spillway Crest (Auxiliary Spillway)	1252.5
Principle Spillway Crest (Service Spillway)	1239.5
Invert of Reservoir Drain Inlet	1218.0

d. Reservoir (acres)

Surface area at Top of Dam	46.2
Surface area at Crest of Emergency Spillway	33.0
Surface area at Crest of Principle Spillway	13.8

e. Storage Capacity (acre-feet)

Top of Dam	608
Emergency Spillway Crest	380
Principle Spillway Crest	88.6

f. Dam

Embankment Type:	Compacted earth fill with an earth keyed cutoff trench	
Embankment length (ft.)		460
Slopes	Upstream	1 vertical on 3 horizontal
	Downstream	1 vertical on 2.5 horizontal
Crest elevation (USGS datum)		1258.2
Crest Width (ft)		16

g. Spillway

Principle Spillway (Service)

Type: Uncontrolled, reinforced concrete, two stage drop inlet (2 x 6 ft.) rising 24.5 feet; 24 inch diameter reinforced concrete pressure conduit 248 feet long; riprapped plunge pool.

Length (ft.): Weir	12

Emergency Spillway (Auxiliary)

Type: Grass-lined channel having trapezoidal cross-section

Bottom Width (ft.)	180
Side Slopes (V : H)	1 on 3
Length of level section (in profile)(ft.)	50
Exit Slope (ft/ft)	0.29

h. Low Level Outlet

Reservoir Drain:

Type: 12 inch diameter cast iron pipe with a reinforced concrete inlet.

Control: Mechanically operated vertical slide gate mounted along the inside of the principle spillway riser.

SECTION 2: ENGINEERING DATA

2.1 DESIGN

a. Geology

The Nanticoke Creek Watershed Project Dam No. 8 is located in the "Glaciated Allegheny Plateau" physiographic province of New York State. Bedrock underlying the site is mapped as Cashaqua Shale of the Upper Devonian Age. This rock was formed approximately 400 million years ago.

Glacial ice was instrumental in smoothing the topography of the area. The present surficial deposits have resulted primarily from glaciations during the Cenozoic Era, the last of which was the Wisconson glaciation, approximately 11,000 years ago. Glacial deposits such as outwash plains and eskers are major features of the landscape in parts of this region.

b. Subsurface Investigations

A subsurface investigation program was conducted by the Soil Conservation Service in 1966. This program consisted of 23 test pits and 13 drill holes. The maximum depth of the explorations was 34 feet. Applicable subsurface information is included in Appendix G.

In general, the surficial soils at the project site consist of a thin layer of topsoil underlain by glacial till on both abutments and by assorted alluvium and reworked till in the floodplain. A gravelly material with moderate to rapid permiability was encountered from 8 to 12 feet in Test Pit No. 1 on the northern abutment. This material was found only in this one test pit. Shale bedrock underlies these soil deposits.

c. Embankment and Appurtenant Structures

The dam was designed by the Soil Conservation Service who prepared a design report. Seventeen drawings, several of which have been included in Appendix G. were prepared for the construction of the dam.

Hydraulically, the dam was designed to retard the floodwaters resulting from a 100 year frequency storm, without a discharge occurring in the emergency spillway.

2.2 CONSTRUCTION RECORDS

Complete as-built contract plans and documents are available from the SCS Office in Broome County. No major construction changes were made on this job. The as-built plans were included in the appendix of this report.

2.3 OPERATION RECORD

Since the dam is an ungated, floodwater retarding structure, no operating records are maintained regarding water levels. However, during periods of heavy rainfall, SCS personnel do monitor reservoir levels.

2.4 EVALUATION OF DATA

The data presented in this report has been compiled from information obtained from the Soil Conservation Service as well as the New York State Department of Environmental Conservation files. It appears to be adequate and reliable for the purpose of the Phase 1 Inspection.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of Dam Site No. 8 was conducted on November 8, 1978. The weather was clear and the temperature was around 50°F. The water surface was several inches above the invert of the low stage inlet on the riser. There was a small flow from the principle spillway pipe spilling into the plunge pool.

b. Embankment

The earth embankment showed no signs of distress. The vertical and horizontal alignment of the crest appears to be as it was constructed, with no visible surface cracks appearing on the crest or embankment slopes. There were no areas of serious sloughing or subsidence noted. Some minor sloughing was observed on the upstream slope in the range of fluctuation of the water surface level.

Inspection of the downstream face did not reveal any signs of seepage. There was a slight discharge from the 8 inch collection pipe of the internal drainage system on the southern side of the principle spillway pipe. The collection pipe to the north of the principle spillway was dry.

No undesirable vegetative growth or animal penetrations into the slopes were observed. However, on the date of the inspection, the grass on the upstream and downstream slope had not been mowed.

c. Principle Spillway

The principle spillway consists of the vertical drop inlet structure, a reinforced concrete pressure pipe through the embankment, a plunge pool and an outlet channel. All of these components were in satisfactory condition. The only minor deficiency noted concerned the plunge pool. The downstream toe of the dam, the bottom of the stream channel and the stream banks were lined with riprap, but there was no riprap in the center of the stream to check the velocity of water coming through the spillway pipe.

d. Emergency Spillway

A grass lined emergency spillway in an earth cut section is located beyond the northern end of the embankment. The spillway had been mowed and appeared to be in satisfactory condition.

e. Drain

The reservoir drain conduit and slide gate may be used to lower the reservoir when the pool level is below the principle spillway crest. The slide gate is located within a pipe sleeve which extends to the top of the riser.

f. Downstream Channel

The outlet channel beyond the end of the plunge pool was heavily overgrown with weeds and brush. However, no severe side-slope erosion or debris obstructions were in evidence.

g. Reservoir

There were no signs of soil instability in the reservoir area.

3.2 EVALUATION OF OBSERVATIONS

Visual observations did not reveal any problems which would adversely affect the safety of the dam.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is approximately at the low stage inlet elevation. Downstream flows are limited by the capacity of the 24 inch diameter reinforced concrete pipe. The reservoir provides 374 acre feet of storage between the normal water level and the crest of the emergency spillway.

4.2 MAINTENANCE OF DAM

The dam is maintained by the owner and is in satisfactory condition. Normal maintenance consists of mowing the crest of the embankment and the bottom of the emergency spillway channel.

4.3 WARNING SYSTEM IN EFFECT

No apparent warning system is present.

4.4 EVALUATION

The dam and appurtenant structures are satisfactorily maintained.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the watershed draining into the reservoir pool area was made using the USGS 7.5 minute quadrangle for Lisle, N.Y. The watershed consists of woodlands and lightly forested area situated in a rural section. Relief ranges from moderate to steep with the steeper slopes occuring on the western side of the watershed. The slopes on the western side range from 15 to 20%, and on the eastern side they range from 5 to 10%. The rectangularly shaped drainage area is about 1382 acres.

5.2 ANALYSIS CRITERIA

The analysis of the spillway capacity of the dam was performed using the Corps of Engineer's HEC-1 computer program, incorporating the "Snyder Synthetic Unit Hydrograph" method and the "Modified Puls" flood routing procedure. The spillway design flood selected for analysis was the PMF in accordance with recommended guidelines of the U.S. Army Corps of Engineers.

5.3 SPILLWAY CAPACITY

The principal and emergency spillways are uncontrolled structures. The principal spillway operates under weir or orifice flow conditions depending upon the floodwater inflow to the reservoir pool. During orifice flow operation, pressure flow develops in the 24 inch conduit. The emergency spillway was analyzed as a broad-crested weir having a discharge coefficient (C) of 3.087.

The spillways have sufficient capacity for discharging the peak outflow from the PMF. Due to the limited storage capacity, there will be little attenuation of the storm flows. For this storm, the peak inflow and the peak outflow are both 3640 cfs. When the spillways are discharging the peak outflow, the water surface will be 2.4 feet below the top of the dam.

5.4 RESERVOIR CAPACITY

Normal flood control storage capacity of the reservoir between the principal and emergency spillways is 291 acre-feet which is equivalent to a runoff depth of 2.5 inches over the drainage area. Surcharge storage capacity to the maximum high water elevation is an additional 228 acre-feet; equivalent to a runoff depth over the drainage area of 2.0 inches. Total storage capacity of the dam is 608 acre-feet; equivalent to 5.3 inches of direct runoff.

5.5 FLOODS OF RECORD

The maximum known flood occured during Huricane Eloise during September, 1975. The pool level at this time was reported to be about 7 feet above the principal spillway crest. The calculated discharge for this flood is as follows:

Elevation (ft.)	Discharge (cfs)
1246.4	61

5.6 OVERTOPPING POTENTIAL

Analysis indicates the total discharge capability is sufficient to prevent overtopping from the PMF.

5.7 EVALUATION

This dam has sufficient capability to impound and adequately discharge floodwaters expected to result from the PMF.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No signs of major distress of the dam were observed during the inspection.

b. Design and Construction Data

Design data was obtained from the Soil Conservation Service Office in Binghamton. Stability analyses were performed by SCS using a modification of the Swedish Circle Method. Various conditions were analyzed during the design process. The conditions applicable to the dam as it was constructed are as follows:

	MINIMUM FACTOR OF SAFETY	
CONDITION	UPSTREAM SLOPE	DOWNSTREAM SLOPE
Full Drawdown	1.69	____
Long Term Steady State Seepage from Emergency Spillway Crest	____	1.60

The calculated factors of safety for this dam are in excess of the minimum factors in the Corps of Engineers recommended guidelines. The dam is therefore considered to have an adequate factor of safety for stability.

A summary of the analyses and sections showing the failure arcs are included in Appendix E.

Based on discussions with SCS representatives, the dam was built essentially according to the plans. The only significant difference was that the rock surface was somewhat deeper than expected.

c. Post Construction Changes

The SCS representatives were not aware of any changes which have been made on the dam.

d. Seismic Stability

This dam is located in Seismic Zone No. 1. Therefore, a seismic stability analysis is not warranted.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase 1 Inspection of the Nanticoke Creek Dam No. 8 did not reveal conditions which constitute a hazard to human life or property. The earth embankment is considered to be stable, structurally, and capable of safely retarding floodwaters resulting from the PMF.

The design of this dam includes an internal drainage system to control the phreatic surface and to provide a safe outlet for foundation seepage.

b. Adequacy of Information

Information concerning the design and performance of this dam is considered adequate for the purposes required for Phase 1 Inspection Reports.

c. Need for Additional Investigations

No additional investigations are necessary at this time.

7.2 RECOMMENDED MEASURES

The following tasks should be undertaken by maintenance forces:

a. Periodic operation and lubrication of the mechanically operated slide gate mechanism to insure the ease of operation of the reservoir drain conduit.

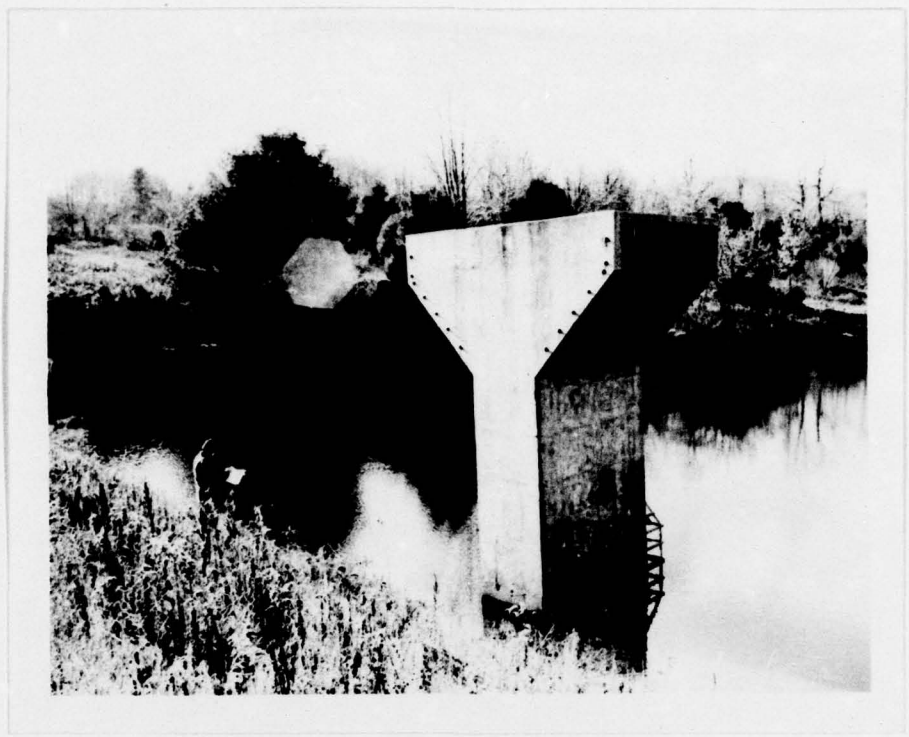
b. A schedule for periodic maintenance should be established which would include items such as mowing the grass on the embankment slopes.

APPENDIX A

PHOTOGRAPHS

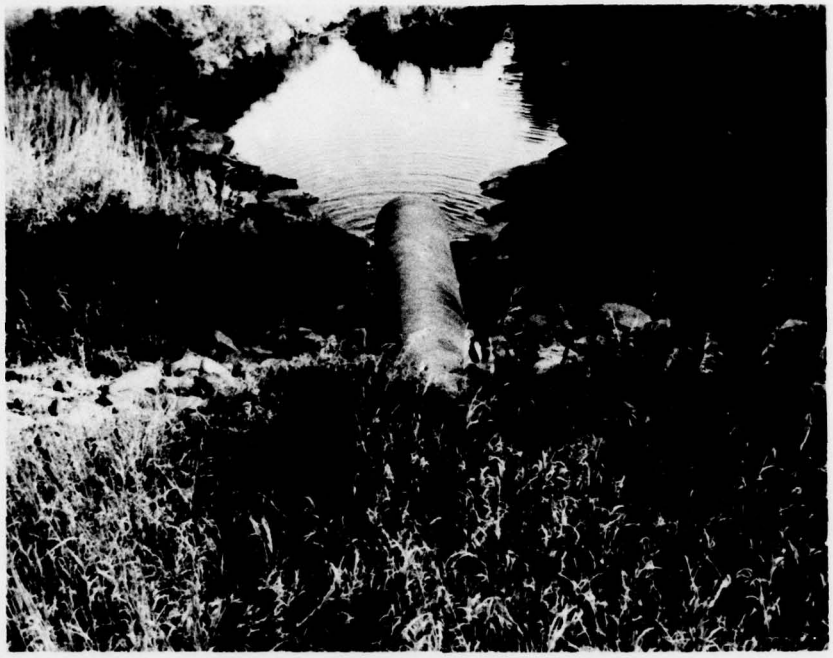
VIEW LOOKING EAST ALONG DAM CREST

EMERGENCY SPILLWAY LOOKING DOWNSTREAM



RISER - PRINCIPAL SPILLWAY INLET

PRINCIPAL SPILLWAY OUTLET PIPE
AND PLUNGE POOL (LOOKING UPSTREAM)



PRINCIPAL SPILLWAY OUTLET PIPE
AND PLUNGE POOL (LOOKING DOWNSTREAM)

OUTLET OF INTERNAL DRAINAGE
SYSTEM COLLECTION PIPE

APPENDIX B

ENGINEERING DATA CHECKLIST

Check List
Engineering Data
Design Construction Operation

Name of Dam NANTICOKE CREEK SITE 8

I.D. # NY-573 (85D-3645)

Item	Remarks		
	Plans	Details	Typical Sections
Dam	YES	YES	YES
Spillway(s)	YES	YES	YES
Outlet(s)	YES	YES	YES
Design Reports	YES		
Design Computations	YES		
Discharge Rating Curves			
Dam Stability	YES		
Seepage Studies	YES		
Subsurface and Materials Investigations	YES		

Item	Remarks
Construction History	ONLY INFORMATION AVAILABLE OBTAINED THROUGH DISCUSSIONS WITH PROJECT INSPECTOR
Surveys, Modifications, Post-Construction Engineering Studies and Reports	NONE REPORTED
Accidents or Failure of Dam Description, Reports	NONE REPORTED
Operation and Maintenance Records Operation Manual	NONE

APPENDIX C

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam NANTICOKE CREEK SITE 8

I.D. # N.Y. 573 (#850-3645

Location: Town NANTICOKE County BROOME

Stream Name UNNAMED

Tributary of NANTICOKE CREEK

Longitude (W), Latitude (N) W076° 4.8' N42° 16.5'

Hazard Category C

Date(s) of Inspection 11/8/78

Weather Conditions SUNNY 45°-50°

b. Inspection Personnel R. WARRENDER; W. LYNICK

c. Persons Contacted H. HIRTH, SCS SYRACUSE

G. PAGE & D. KOLESAR, SES BROOME Co.

d. History:

Date Constructed 1970

Owner BROOME COUNTY

Designer SCS

Constructed by C.D. MURRAY

2) Technical Data

Type of Dam EARTH

Drainage Area 1382 ACRES

Height 41 ft. Length 460 ft

Upstream Slope 1 on 3 Downstream Slope 1 on 2.5

2) Technical Data (Cont'd.)

External Drains: on Downstream Face _____ @ Downstream Toe RIP RAP

Internal Components:

Impervious Core _____

Drains 8" CMP DRAIN PIPE IN SAND & GRAVEL DRAIN

Cutoff Type COMPACTED EARTH FILL

Grout Curtain _____

3) Embankment

EARTH FILL WITH GOOD VEGETATIVE COVER

a. Crest

(1) Vertical Alignment OKAY

(2) Horizontal Alignment OKAY

(3) Surface Cracks NONE

(4) Miscellaneous CREST WAS ONLY PART OF EMBANKMENT WHICH HAD BEEN MOWED.

b. Slopes

(1) Undesirable Growth or Debris, Animal Burrows SLOPES HAD NOT BEEN MOWED

(2) Sloughing, Subsidence or Depressions MINOR SLOUGHING ON UPSTREAM SLOPE AT WATER SURFACE ELEVATION (WITHIN RANGE OF FLUCTUATION)

(3) Slope Protection UNMOWED GRASS AND CROWNVETCH

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage NONE

(6) Condition Around Outlet Structure SATISFACTORY

c. Abutments

(1) Erosion at Embankment and Abutment Contact NONE

(2) Seepage along Contact of Embankment and Abutment NONE

(3) Seepage at toe or along downstream face NONE

d. Downstream Area - below embankment

(1) Subsidence, Depressions, etc. NONE

(2) Seepage, unusual growth NONE

(3) Evidence of surface movement beyond embankment toe NO EVIDENCE

(4) Miscellaneous

e. Drainage System

2-8" DIAMETER BIT. COATED CMP IN SAND & GRAVEL DRAIN FILL

(1) Condition of relief wells, drains, etc. _____

(2) Discharge from Drainage System VERY SLOW (LESS THAN 3 GAL./HOUR)

4) Instrumentation

(1) Monumentation/Surveys N/A

(2) Observation Wells N/A

(3) Weirs N/A

(4) Piezometers N/A

(5) Other

5) Reservoir

a. Slopes TREES AND GRASS UP TO EDGE OF RESERVOIR

b. Sedimentation NONE

c) Spillway(s) (including tail race channel)

a. General RISER, OUTLET PIPE & PLUNGE POOL IN SATISFACTORY CONDITION

b. Principle Spillway 24.5' HIGH RECTANGULAR RC DROP INLET; 24" DIA RC PRESSURE PIPE; RIP RAP LINED PLUNGE POOL AT OUTLET

c. Emergency or Auxiliary Spillway GRASS LINED TRAPEZOIDAL OPEN CHANNEL IN EARTH CUT

d. Condition of ~~Tail race~~ OUTLET channel RIP RAP ON SIDES OF CHANNEL FORMED PLUNGE POOL - NO RIP RAP ACROSS CENTER OF CHANNEL TO CHECK VELOCITY OF FLOWS EXITING FROM SPILLWAY PIPE.

e. Stability of Channel side/slopes NO SPECIAL TREATMENT BEYOND ENDS OF PLUNGE POOL; BRUSH & WEEDS GROWING ON CHANNEL BANKS.

7) Downstream Channel

c. Condition (debris, etc.) TREES AND BRUSH LINING STREAM BANKS

b. Slopes 1 ON 1 - NOT RIPRAPPED, ALTHOUGH SOME STONE PRESENT.

c. Approximate number of homes VILLAGE OF MAINE PLUS 3 HOMES NEAR THE POINT WHERE THE STREAM PASSES UNDER THE COUNTY HIGHWAY

8) Miscellaneous

9) Structural

a. Concrete Surfaces SATISFACTORY

b. Structural Cracking NONE

c. Movement - Horizontal & Vertical Alignment (Settlement) NONE

d. Junctions with Abutments or Embankments N/A

e. Drains - Foundation, Joint, Face N/A

f. ~~Water passages~~, conduits, ~~sluices~~ SATISFACTORY

g. Seepage or Leakage NONE

h. Joints - Construction, etc. _____

i. Foundation _____

j. Abutments _____

k. Control Gates RESERVOIR DRAIN HAS SLIDE GATE

l. Approach & Outlet Channels _____

m. Energy Dissipators (plunge pool, etc.) PIPE EXTENSION SATISFACTORY

n. Intake Structures _____

o. Stability _____

p. Miscellaneous _____

APPENDIX D

HYDROLOGIC/HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1258.2	46.2	608
2) Design High Water (Max. Design Pool)	1255.2	39.0	476
3) Auxiliary Spillway Crest	1252.5	33.0	380
4) Pool Level with Flashboards	N/A		
5) Service Spillway Crest	1239.5	13.8	88.6

DISCHARGES

	Volume (cfs)
1) Average Daily	N/A
2) Spillway @ Maximum High Water	70.1
3) Spillway @ Design High Water	67.8
4) Spillway @ Auxiliary Spillway Crest Elevation	65.6
5) Low Level Outlet	18.7
6) Total (of all facilities) @ Maximum High Water	8350.2
7) Maximum Known Flood	ELEV. = 1246.4

CREST: ELEVATION: 1258.2

Type: LEVEL; GRASSED EARTH

Width: 16 ft. Length: 460 ft.

Spillover N/A

Location

SPILLWAY:

PRINCIPAL		EMERGENCY
1239.5	Elevation	1252.5
RC DROP INLET W/TRASH RACK	Type	TRAPEZOIDAL CHANNEL
2ft x 6ft	Width	180ft 1 ON 3 SLOPES
	Type of Control	
✓	Uncontrolled	✓
	Controlled:	
N/A	Type (Flashboards; gate)	N/A
N/A	Number	N/A
N/A	Size/Length	N/A
	Invert Material	MOWED GRASS
	Anticipated Length of operating service	< 1 PER 100 YRS
24" DIA RC CONDUIT - 248' LONG	Length	600 ft.
SHARP CRESTED $L/b = 1.0$	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	N/A BROAD CRESTED

WEIR LENGTH = 12'

~~OUTLET CONDUITS~~/EMERGENCY DRAWDOWN FACILITIES: -RESERVOIR DRAIN

Type: Gate √ Sluice ____ Conduit √ Penstock ____

Shape : GATE-FLAT CIRCULAR CONDUIT-ROUND CAST IRON

Size: ____

Elevations: Entrance Invert 1215.5

Exit Invert 1210.5

Tailrace Channel: Elevation 1208.5

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: ____

Records:

Date - ____

Max. Reading - ____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

NONE EXCEPT FOR MANUALLY OPERATED RESERVOIR DRAIN SLIDE GATE

DRAINAGE AREA: 1382 ACRES 2.16 SQ.MI.

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: LIGHT FOREST & WOODLANDS

Terrain - Relief: MODERATE TO STEEP

Surface - Soil: GLACIAL TILL

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

NONE

Potential Sedimentation problem areas (natural or man-made; present or future)

NONE

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

NONE

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: NONE

Elevation:

Reservoir:

Length @ Maximum Pool N/A (Miles)

Length of Shoreline (@ Spillway Crest) N/A (Miles)

[illegible] DAM #6

D.A. = Drainage area in square miles

L = River mileage from the given station to the upstream limits of the drainage area

L_{CA} = River mileage from the station to the center of gravity of the drainage area

PMP = Probable Maximum Precipitation in inches

t_p = Lag time from mid-point of unit rainfall duration, t_r, to peak of unit hydrograph, in hours.

t_r = Unit rainfall duration, equal to $\frac{t_p}{550}$, in hours.

C_t = Coefficient depending upon units and drainage basin characteristics

t_R = Unit rainfall duration other than standard unit, t_r, adopted in specific study, in hours.

t_{pR} = Lag time from mid-point of unit rainfall duration, t_R, to peak of unit hydrograph, in hours

D.A = 2.16 square miles, L = 3.33 miles, L_{CA} = 1.32 miles

PMP = 20.5 inches C_t = 2.0,

C_p = 0.625 from average 640 C_p = 400

$t_p = C_t (L \cdot L_{CA})^{0.3} = 2.0[(3.33)(1.32)]^{.3} = 3.12$ hours

$t_r = \frac{t_p}{5.5} = \frac{3.12}{5.5} = .57$ hours (Use 1 hr. t_c hydrograph)

$t_{pR} = t_p + 0.25(t_R - t_r) = (3.12) + .25(1 - .57) = 3.23$ hrs.

From HMR 33 - Figure 2, Depth - Area - Duration

ZONE 1 PREC. = 20.5"

6 hour % 111 = 22.55, 12 hour % 133 = 27.26

24 hour % 122 = 25.01, 48 hour % 142 = 29.11

GA-17 (4/70) NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
NA[illegible] CREEK S[illegible] - B	1		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROLOGY & HYDRAULIC COMPUTATIONS		RLW	1/30/70

PRINCIPAL SPILLWAY CAPACITY

WATER SURFACE AT AUXILIARY SPILLWAY CREST

$$q = A\sqrt{\frac{2gH}{1+K_e+K_b+K_dL}} = 3.14\sqrt{\frac{2(32.2)(41)}{1+.5+.45+(.0165)(248)}} = 65.64\ cfs$$

WATER SURFACE AT DESIGN HIGH WATER

$$q = 3.14\sqrt{\frac{2(32.2)(43.7)}{1+.5+.45+(.0165)(248)}} = 67.77\ cfs$$

WATER SURFACE AT TOP OF DAM

$$q = 3.14\sqrt{\frac{2(32.2)(46.7)}{1+.5+.45+(.0165)(248)}} = 70.06\ cfs$$

EMERGENCY SPILLWAY CAPACITY

WATER SURFACE AT TOP OF DAM

$$q = CLH^{3/2} = (3.087)(197.1)(5.7)^{3/2} = 8280.1\ cfs$$

$$L = 180 + (2.85)(3)(2) = 197.1$$

RESERVOIR DRAIN CAPACITY

WATER SURFACE AT PRINCIPAL SPILLWAY CREST

$$q = .78\sqrt{\frac{2(32.2)(24.5)}{1+.5+0+.0417(30)}} = 18.68\ cfs$$

GA-17 (4/70) NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
WALT LANE CREEK SITE 3	2		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROLOGY & HYDRAULIC COMPUTATIONS		RLW	2/2/79

DEPTH OF FLOW IN EMERGENCY SPILLWAY DURING PMF

$$Q = cLH^{3/2} \Rightarrow H^{3/2} = \frac{Q}{cL} = \frac{3577}{(3.087)(189)} = 6.13 \Rightarrow H = 3.35'$$

$Q = 3643 - 66 = 3577$

$L = 180 + (1.5)(3)(2) = 189$

```
**********
HEC-1 VERSION DATED JAN 1973
UPDATED AUG 74
CHANGE NO. 01
**********
                    HAUTICOKE CREEK WATERSHED PROJECT SITE NO 8
                    PMF WITH RATIOS
                    DATE

                                  JOB SPECIFICATION
                      NW   NHR  NMIN  IDAY   IHR  IMIN METRC  IPLT  IPRT NSTAN
                     100     1     0     0     0     0     0     0     0     0
                                      JOPER      NWT
                                         5        0


                              MULTI-PLAN ANALYSES TO BE PERFORMED
                                  NPLAN= 1 NRTIO= 2 LRTIO= 1
                          RTIOS=   0.50   1.00

     **********          **********          **********          **********          **********

                                SUB-AREA RUNOFF COMPUTATION
                             ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT   INAME
                                1       0       0       0       0       0       0

                                    HYDROGRAPH DATA
                   IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
                       1       1    2.16      0.    2.16      0.      0.        0       0       0

                                      PRECIP DATA
                            SPFE     PMS      R6      R12     R24     R48     R72     R96
                            0.     20.50  111.00  122.00  133.00  142.00    0.      0.
TRSPC COMPUTED BY THE PROGRAM IS 0.738

                                      LOSS DATA
                   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
                    0.      0.      1.00     0.      0.      1.00    1.00    0.10     0.      0.

                                  UNIT HYDROGRAPH DATA
                              TP=  3.00    CP=0.63    NTA=  0

                                  RECESSION DATA
                              STRTQ=    4.00    QRCSN=    4.00    RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.71 AND R= 2.44 INTERVALS

          UNIT HYDROGRAPH 19 END-OF-PERIOD ORDINATES, LAG=   2.98 HOURS, CP= 0.63  VOL= 1.00
      47.     163.     269.     283.     215.     142.      93.      62.      41.      27.
      18.      12.       8.       5.       3.

                                  END-OF-PERIOD FLOW
                                TIME   RAIN   EXCS    COMP Q
                                   1   0.01   0.          4.
                                   2   0.01   0.          4.
                                   3   0.01   0.          4.
```

9	0.02	0.	4.
10	0.02	0.	4.
11	0.02	0.	4.
12	0.02	0.	4.
13	0.11	0.	4.
14	0.14	0.	4.
15	0.17	0.	4.
16	0.43	0.01	4.
17	0.16	0.06	8.
18	0.12	0.02	17.
19	0.01	0.	26.
20	0.01	0.	29.
21	0.01	0.	25.
22	0.01	0.	18.
23	0.01	0.	13.
24	0.01	0.	10.
25	0.11	0.01	9.
26	0.11	0.01	9.
27	0.11	0.01	11.
28	0.11	0.01	13.
29	0.11	0.01	15.
30	0.11	0.01	17.
31	0.28	0.18	25.
32	0.28	0.18	53.
33	0.28	0.18	98.
34	0.28	0.18	145.
35	0.28	0.18	181.
36	0.28	0.18	205.
37	1.68	1.58	286.
38	2.01	1.91	540.
39	2.52	2.42	1003.
40	6.38	6.28	1757.
41	2.35	2.25	2731.
42	1.65	1.75	3507.
43	0.17	0.07	3640.
44	0.17	0.07	3111.
45	0.17	0.07	2323.
46	0.17	0.07	1613.
47	0.17	0.07	1097.
48	0.17	0.07	756.
49	0.	0.	526.
50	0.	0.	369.
51	0.	0.	253.
52	0.	0.	167.
53	0.	0.	107.
54	0.	0.	67.
55	0.	0.	31.
56	0.	0.	17.
57	0.	0.	9.
58	0.	0.	7.
59	0.	0.	6.
60	0.	0.	5.
61	0.	0.	5.
62	0.	0.	4.
63	0.	0.	4.
64	0.	0.	4.
65	0.	0.	4.
66	0.	0.	4.
67	0.	0.	4.

92	0.	0.	4.
93	0.	0.	4.
94	0.	0.	4.
95	0.	0.	4.
96	0.	0.	4.
97	0.	0.	4.
98	0.	0.	4.
99	0.	0.	4.
100	0.	0.	4.
SUM	21.52	17.84	25082.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3640.	2845.	1024.	347.	25084.
INCHES		12.25	17.64	17.92	18.00
AC-FT		1411.	2032.	2065.	2074.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	4.	8.	13.	14.
12.	9.	7.	5.	4.	5.	6.	7.	8.	8.
13.	26.	47.	73.	91.	102.	143.	270.	502.	879.
1366.	1754.	1820.	1555.	1162.	806.	548.	378.	264.	185.
127.	83.	54.	33.	16.	9.	4.	4.	3.	3.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1820.	1422.	512.	173.	12542.
INCHES		6.13	8.82	8.96	9.00
AC-FT		706.	1016.	1032.	1037.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	8.	17.	26.	29.
25.	18.	13.	10.	9.	9.	11.	13.	15.	17.
25.	53.	98.	145.	181.	205.	286.	540.	1003.	1757.
2731.	3507.	3640.	3111.	2323.	1613.	1097.	756.	528.	369.
253.	167.	107.	67.	31.	17.	9.	7.	6.	5.
5.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3640.	2845.	1024.	347.	25084.
INCHES		12.25	17.64	17.92	18.00

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED HYDROGRAPH AT DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
1	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.	0.	0.	1	1

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.	0.	0.	89.

STORAGE=	89.	330.	608.	0.	0.	0.	0.	0.	0.	0.
OUTFLOW=	0.	66.	8350.	0.	0.	0.	0.	0.	0.	0.

STATION 1, PLAN 1, RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	1.	1.	1.	1.	1.
1.	1.	2.	2.	2.	2.	2.	2.	2.	2.
2.	3.	3.	4.	6.	7.	10.	13.	20.	32.
52.	1021.	1940.	1637.	1303.	920.	629.	430.	299.	209.
145.	97.	66.	65.	64.	63.	62.	61.	60.	59.
58.	57.	56.	55.	54.	53.	52.	51.	50.	49.
49.	48.	47.	46.	45.	44.	44.	43.	42.	41.
41.	40.	39.	39.	38.	37.	37.	36.	35.	35.
34.	34.	33.	32.	32.	31.	31.	30.	30.	29.

STOR

89.	89.	89.	89.	89.	90.	90.	90.	90.	90.
90.	90.	91.	91.	91.	91.	91.	92.	92.	93.
94.	95.	96.	96.	96.	97.	97.	97.	98.	98.
99.	100.	103.	106.	114.	122.	131.	147.	178.	233.
322.	400.	432.	423.	414.	404.	395.	390.	386.	384.
382.	381.	380.	378.	375.	370.	366.	361.	356.	351.
347.	342.	338.	333.	329.	325.	321.	316.	312.	308.
305.	301.	297.	293.	290.	286.	283.	279.	276.	273.
269.	266.	263.	260.	257.	254.	251.	248.	246.	243.
240.	238.	235.	232.	230.	228.	225.	223.	220.	218.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1940.	1242.	392.	152.	10989.
INCHES		5.35	6.76	7.87	7.89
AC-FT		616.	778.	907.	909.

STATION 1, PLAN 1, RTIO 2

0.	0.	0.	0.	0.	0.	0.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
3.	3.	3.	3.	3.	4.	4.	4.	4.	4.
5.	5.	7.	9.	11.	15.	19.	26.	40.	65.
2529.	3217.	3645.	3321.	2596.	1842.	1257.	860.	598.	419.
296.	194.	126.	79.	65.	64.	64.	63.	61.	60.
57.	55.	57.	56.	55.	55.	54.	53.	52.	51.
50.	49.	48.	48.	47.	46.	45.	44.	44.	43.
42.	42.	41.	40.	39.	39.	38.	38.	37.	36.
36.	35.	35.	34.	33.	33.	32.	32.	31.	31.

STOR

353.	349.	344.	339.	335.	331.	327.	286.	283.	279.
311.	307.	303.	300.	296.	293.	289.	286.	283.	279.
276.	273.	270.	267.	264.	261.	258.	255.	253.	250.
247.	245.	242.	240.	237.	235.	232.	230.	228.	226.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3645.	2875.	904.	325.	23442.
INCHES		12.39	15.57	16.80	16.83
AC-FT		1426.	1794.	1935.	1938.

********** ********** ********** ********** **********

PEAK FLOW SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS

ATION	STATION	PLAN	RATIOS APPLIED TO FLOWS 0.50	1.00
DGR.PH AT	1	1	1820.	3640.
		2	0.	0.
ED TO	1	1	1940.	3645.
		2	0.	0.

APPENDIX E

STABILITY ANALYSES

C. Slope Stability Analysis: The analysis is limited to the embankment assuming that soft foundation soils are removed to elevation 1211 and replaced with embankment soils. The method of analysis is a modification of the Swedish circle.

A 3:1 upstream slope with 10 ft berm is adequate assuming drawdown to the base.

In the steady seepage case with the phreatic line from the emergency spillway crest to the downstream slope, the factor of safety is 1.5 for a 2 1/2:1 slope and 10 ft wide berm. The factor of safety is 1.6 with a drain at c/b = 0.6 and no berm.

Shear values from sample 66W1301, Site 13, resulted in higher factors of safety than those from sample 67W735.

CONCLUSIONS AND RECOMMENDATIONS

A. Preparation: Remove deleterious and soft material from the foundation.

B. Cutoff and Drainage: Interupt disturbed surface soils on the abutments with a partial cutoff. Cut off the permeable alluvial gravels labeled "B" on Form SCS-35B to till or bedrock. A 30 ft bottom width is suggested through the narrow floodplain to keep the hydraulic gradient near 1.0.

A trench drain is recommended to pick up seepage that bypasses the cutoff into alluvial gravels downstream. Extend the drain up both abutments to permanent pool level taking it to bedrock in the right abutment. A transverse drain (or lateral) can be placed against the sandy silt should this material (labeled "G") be continuous downstream. Drain filter elements can be designed in the field.

EMBANKMENT

A. Placement of Material: Soils represented by samples tested can be placed anywhere in the embankment.

Standard density of the minus 3/4 inch fraction of samples 67W735 and 67W736 is about 124 pcf, correcting density of the minus No. 4 fraction for 15% rock. This agrees well with similar samples from Site No. 13 which had minus 3/4 inch standard densities of 123 and 123.5 pcf. It is concluded that compaction control for this site can be based on 95% of standard density using either the minus No. 4 or the minus 3/4 inch fraction.

Form SCS 157
Rev. 6-65

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SUMMARY - SLOPE STABILITY ANALYSIS

MATERIALS TESTING REPORT

PROJECT and STATE

METHOD OF ANALYSIS

ANALYZED BY

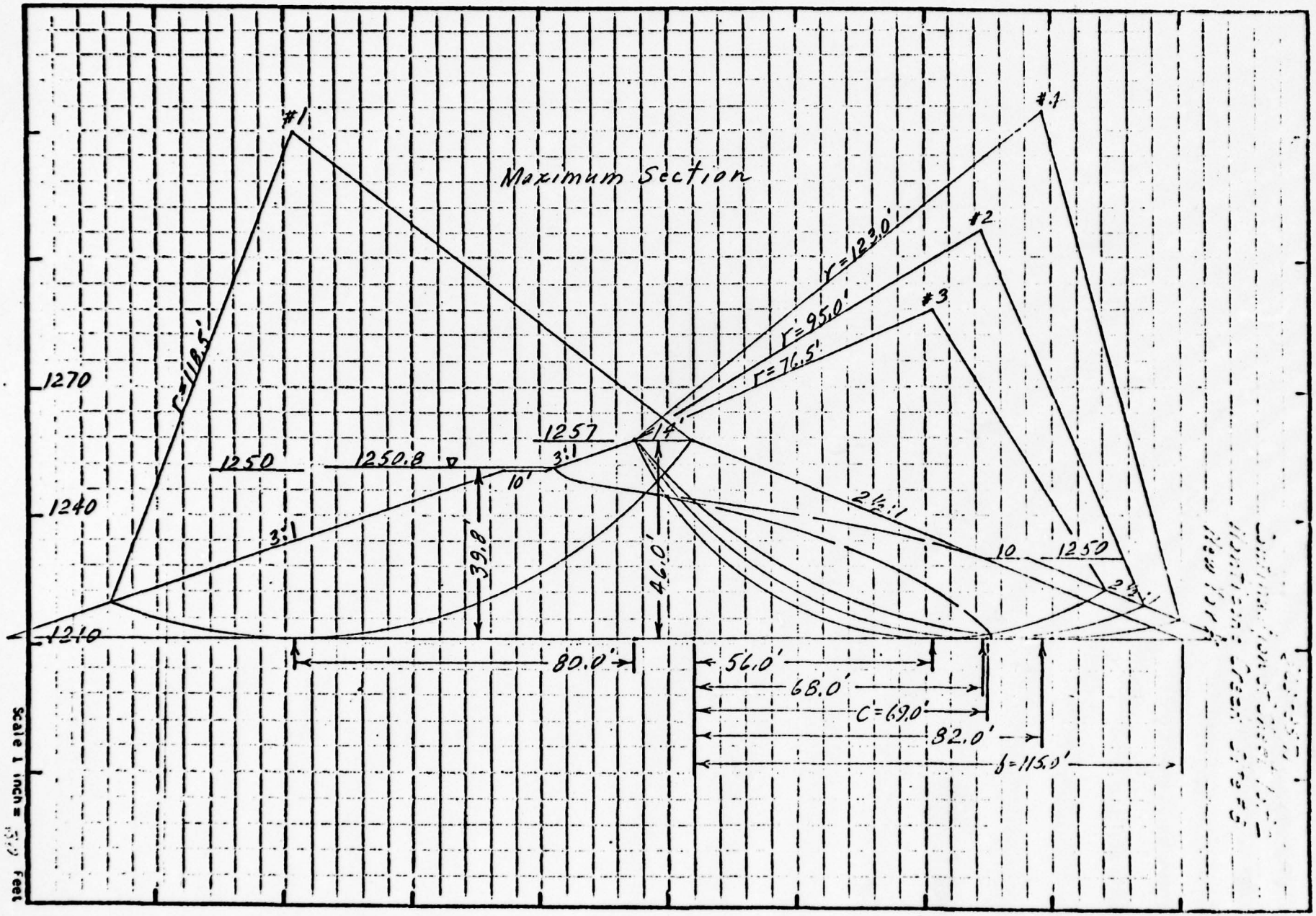
APPROVED BY

DATE

SOURCE AND USE OF MATERIALS	CLASSIFICATION	ADOPTED DESIGN DATA							REMARKS
		γ_d (pcf)	γ_m (pcf)	γ_{sat} (pcf)	γ_{sub} (pcf)	ϕ (deg.)	tan ϕ	c (psf)	
① Emer Spwy Embank.	CL	124.0	135.0	141.0	78.5	17	0.306	550	Sat. -CU Shear
② Site #13 Embank.	CL	123.0	135.0	142.0		22	0.404	450	-CU
③	CL	123.0	135.0	140.0		29.5	0.566	375	-CU Values
④									
⑤									
⑥									
⑦									
⑧									

TRIAL NO.		SLOPE	CONDITIONS	F_s
			Maximum Section	
1	Up	3:1	Full drawdown - 10' berm @ elev. 1250 - Arc cut from opp. sh'ldr. thru Emb. (17°-550) only.	1.69
2	Dn	2½:1	No drain - No berm - Arc cut from opp. sh'ldr. thru Emb. (17°-550) only.	1.39
2A	Dn	2½:1	Same as #2 but 10' berm @ elev. 1230.	1.51
2B	Dn	2½:1	Same as #2 but Emb. (22°-650) only.	1.72
2C	Dn	2½:1	Same as #2 but Emb. (29.5°-375) only.	1.61
2D	Dn	2½:1	Same as #2 except drain @ 9/6 = 0.6	1.60
3	Dn	2½:1	No drain - 10' berm @ elev. 1230 - Arc cut from opp. sh'ldr. thru Emb (17°-550).	1.56
4	Dn	2½:1	No drain - 10' berm @ elev. 1230 - Arc cut from opp. sh'ldr. thru Emb (17°-550) only.	1.60

Sheet 1 of 2


Maximum Section
#1
#1.1
#2
#3
r=118.5'
r=123.0'
r=95.0'
r=76.5'
1270
1240
1210
1257
1250
1250.8
3:1
10'
14'
2½:1
39.8'
46.0'
80.0'
56.0'
68.0'
C=69.0'
82.0'
δ=115.0'
Scale 1 inch = 50 feet

APPENDIX F

LIST OF REFERENCES

APPENDIX F

REFERENCES

1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.

2) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.

3) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

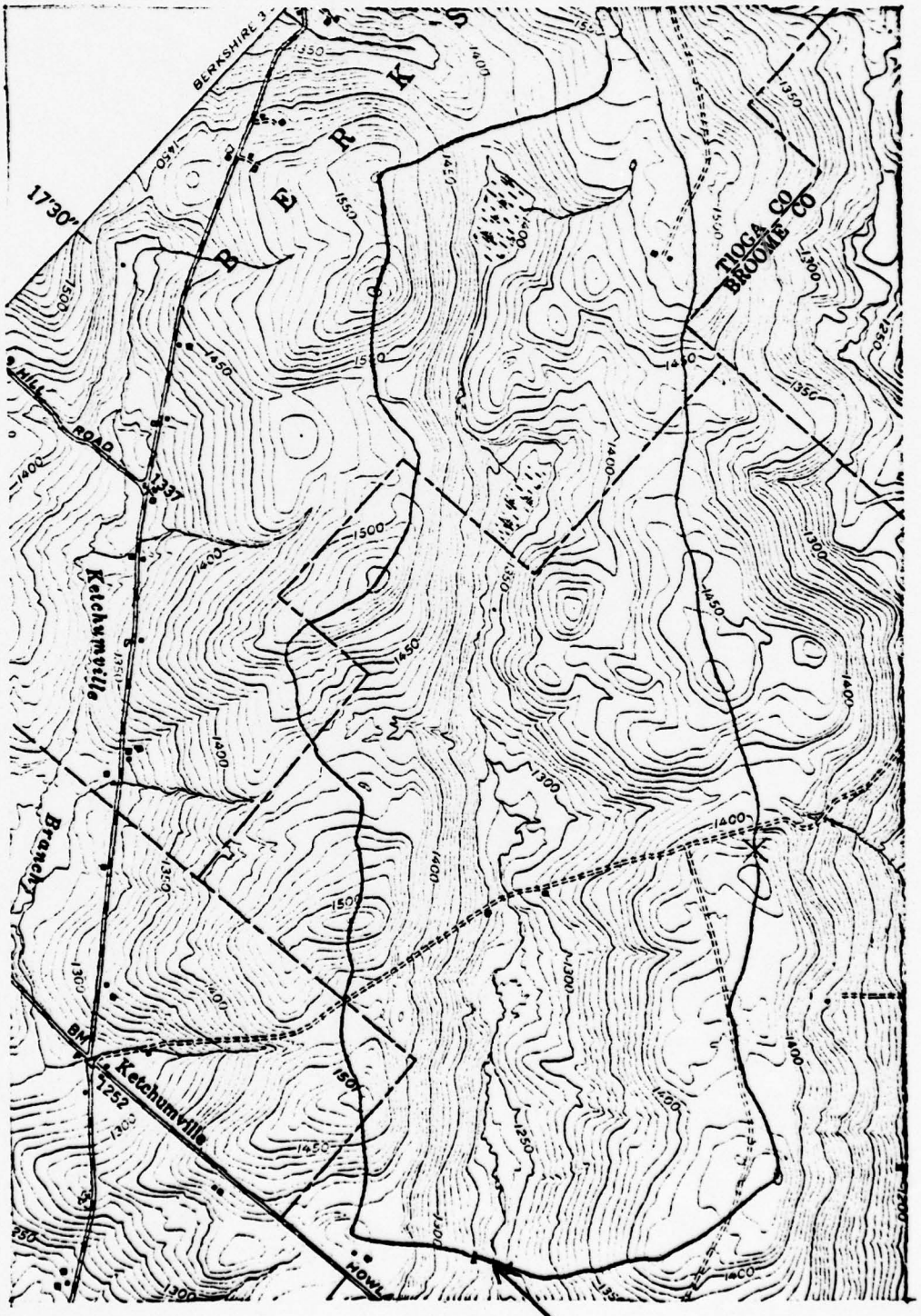
4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960

APPENDIX G

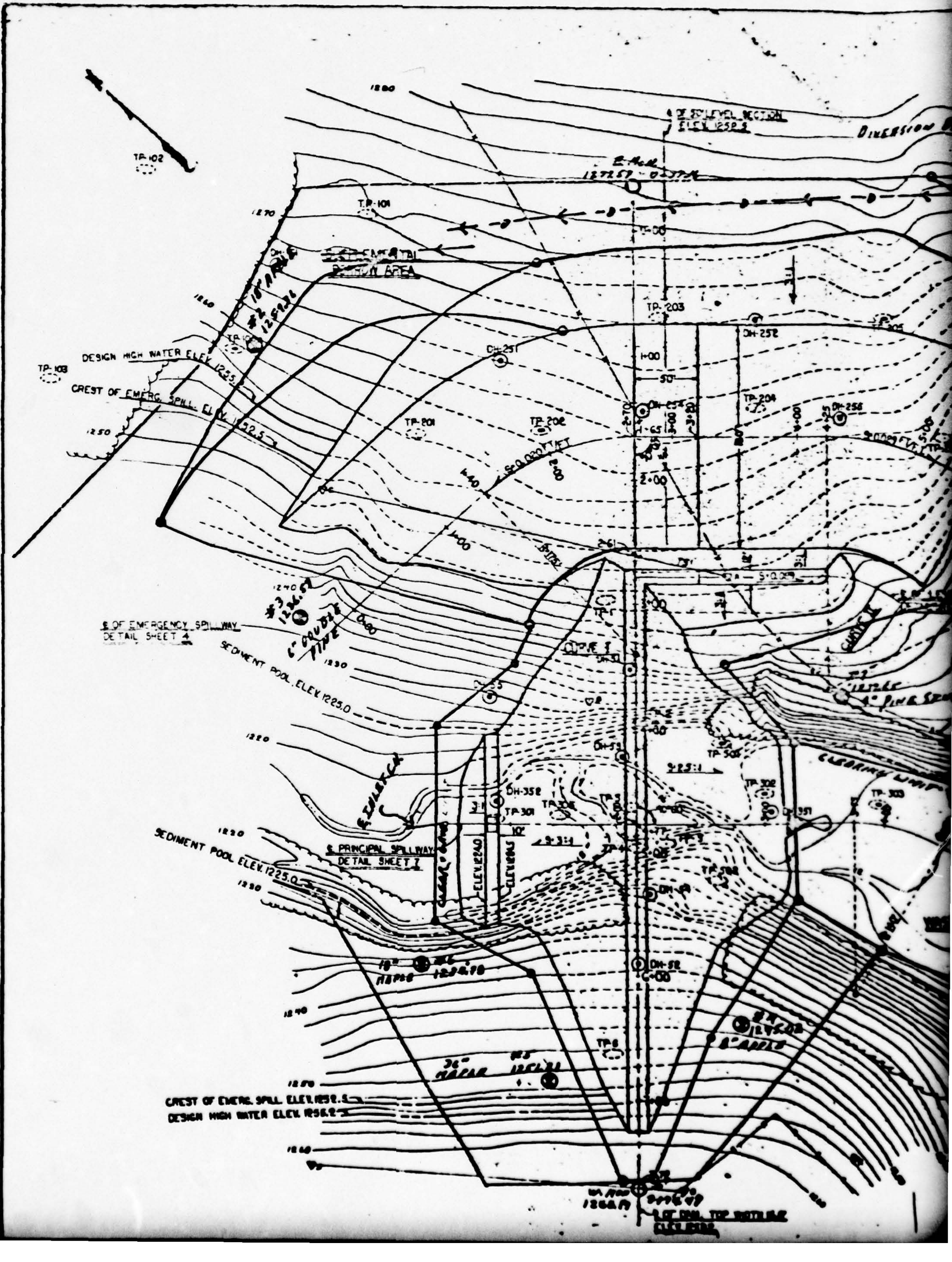
DRAWINGS

VICINITY MAP

NANTICOKE CREEK WATERSHED PROTECTION PROJECT
DAM SITE No. 8



TOPOGRAPHIC MAP
NANTICOKE CREEK WATERSHED PROTECTION PROJECT
DAM SITE No. 8



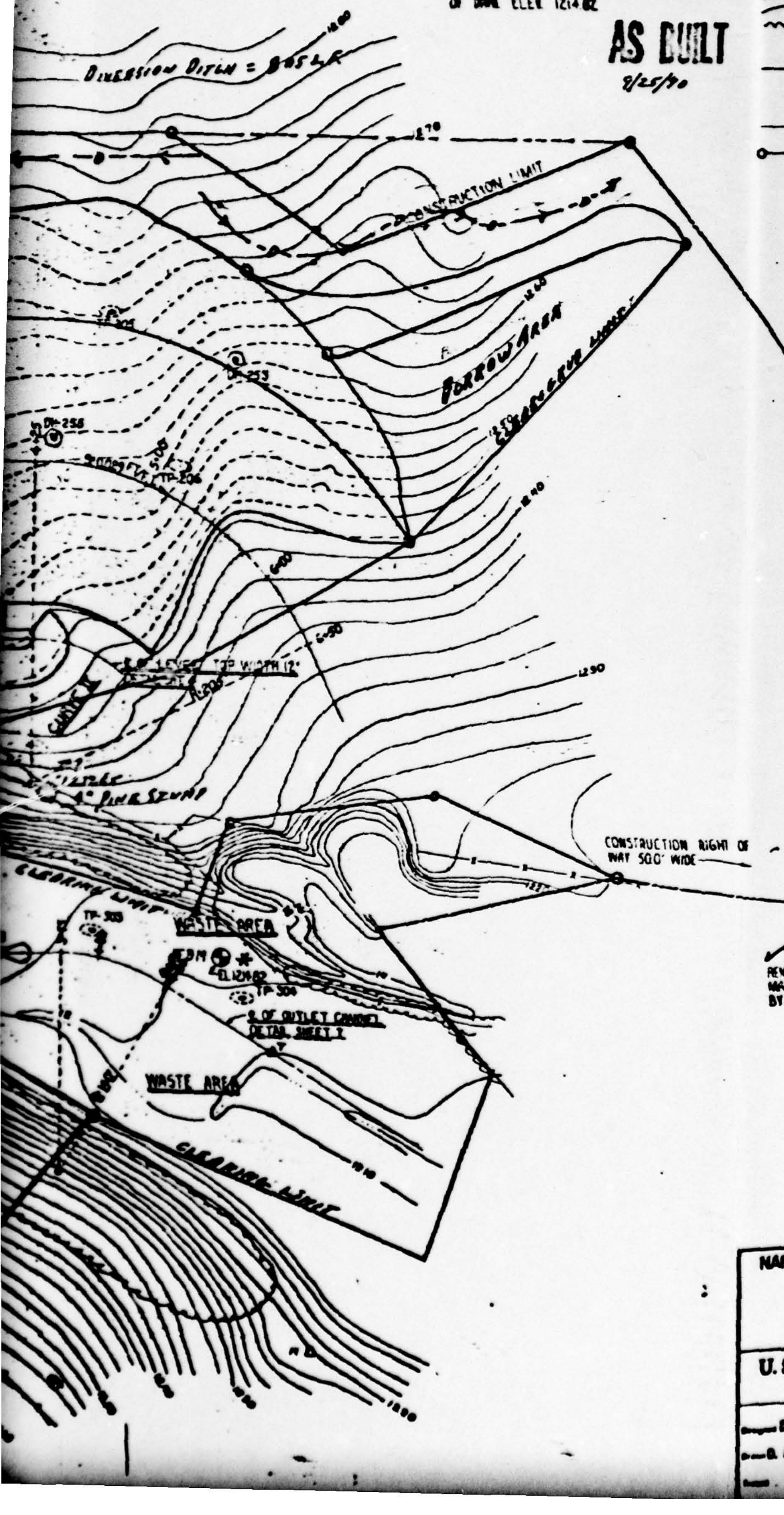
TP-102
TP-101
TP-103
1280
1270
1260
1250
1240
1230
1220
DESIGN HIGH WATER ELEV. 1255.
CREST OF EMERG. SPILL. ELEV. 1252.5
℄ OF EMERGENCY SPILLWAY
DETAIL SHEET 4
SEDIMENT POOL ELEV. 1225.0
℄ PRINCIPAL SPILLWAY
DETAIL SHEET 7
CREST OF EMERG. SPILL. ELEV. 1252.5
DESIGN HIGH WATER ELEV. 1256.2
DIVERSION
TP-203
DH-251
DH-252
TP-201
TP-202
TP-204
DH-256
2+00
1+00
50'
TP-302
TP-303
TP-301
DH-352
DH-351
TP-305
TP-8
DH-52

BENCH MARK DESCRIPTION

* NAIL IN SCS STANDARD ALUMINUM DISC 1.8' ABOVE GROUND, IN 14" DBH WHITE PINE TREE 250.0' DOWNSTREAM FROM ℄ OF DAM. ELEV. 1214.82

AS BUILT

9/25/70



LEGEND

- DESIGN HIGH WATER
- CREST OF EMERG. SPILL.
- SEDIMENT POOL
- ℄ OF STREAM
- CONTOUR LINES
- WOODS LINE
- BENCH MARK
- TRAVERSE STATIONS
- CONSTRUCTION LIMITS
- DRILL HOLES
- TEST PIT (LOGGED & SAMPLED)
- TEST PIT (LOGGED ONLY)
- FENCE LINE (EXISTING)
- AS BUILT

CURVE DATA

LAYOUT DATA FOR CURVE I

Δ = 42°34' T = 68.17'
R = 175' E = 12.87'
D = 32°44' M = 11.94'
L = 130.0'

℄ STATION	DEFLECTION	CHORD DIST
2+70	0	0.0
2+60	5-38	10.0
2+35	5-46	25.0
2+10	9-49	25.0
1+85	13-55	25.0
1+60	18-00	25.0
1+40	21-17	20.0

LAYOUT DATA FOR CURVE II

Δ = 62°-53' T = 125.34'
R = 205' E = 35.28'
D = 27°57' M = 30.10'
L = 225'

℄ STATION	DEFLECTION	CHORD DIST
4+25	0	0.0
4+50	5-30	25.0
4+75	6-59	25.0
5+00	10-29	25.0
5+25	13-58	25.0
5+50	17-28	25.0
5+75	20-58	25.0
6+00	24-27	25.0
6+25	27-57	25.0
6+50	31°-26	25.0

FOUNDATION EXCAVATION IN FLOOD PLAIN

REMOVE THE SILTY, SOFT GREY TILL, AND ORGANIC MATTER WITHIN THE BASE OF THE DAM AS REPRESENTED BY MATERIAL "B" ON SHEET 15.

0 25 50 100
SCALE IN FEET

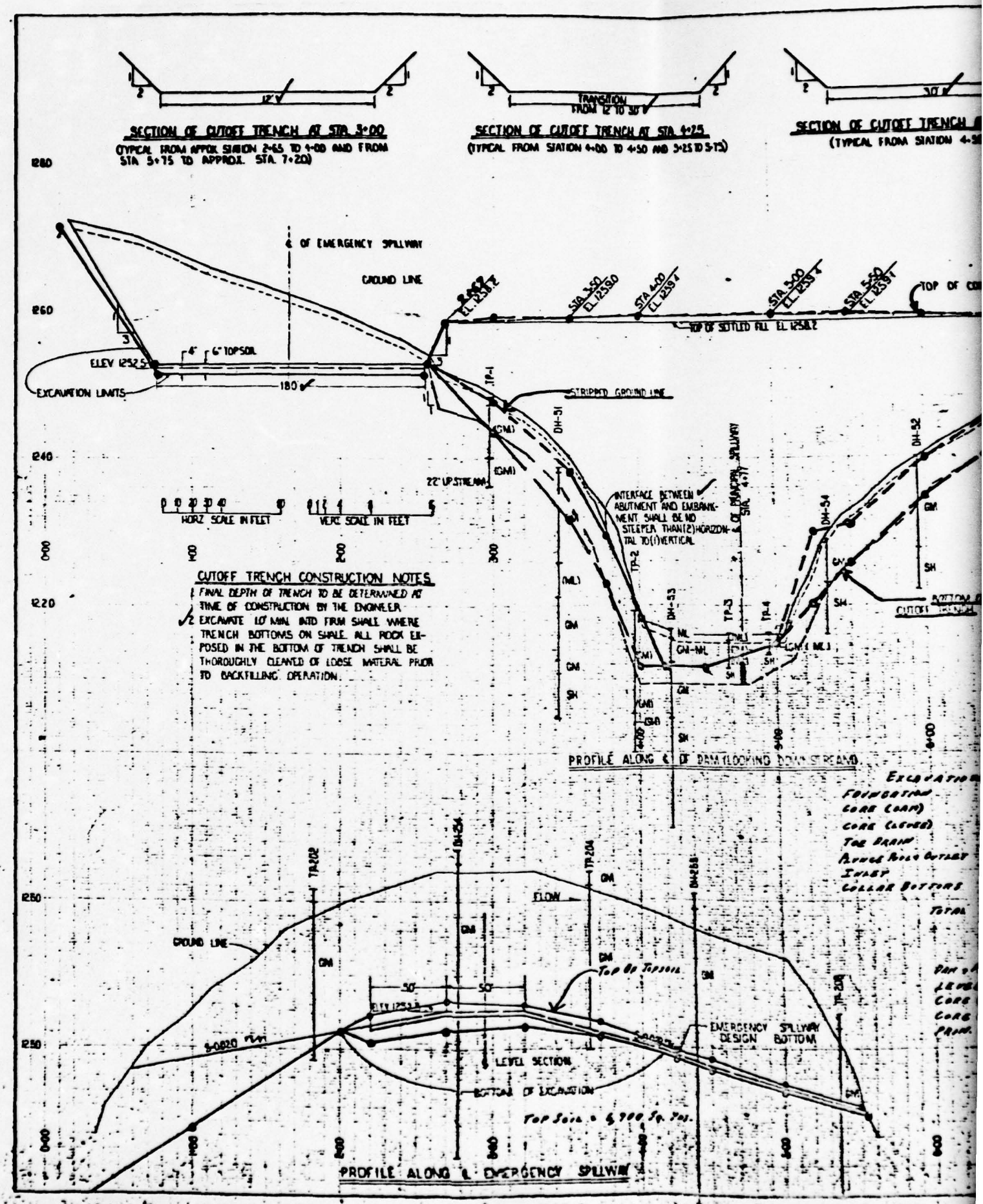
2' CONTOUR INTERVALS

NANTICOKE CREEK WATERSHED PROJECT
SITE 8
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
PLAN OF STRUCTURAL WORKS

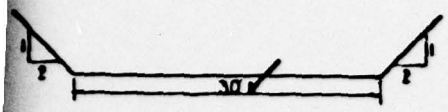
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed D. ZOGRAFOS 3/66
Drawn D. ANGELO 3/66
Approved by ...
Title ...
Sheet 3 Drawing No. NY-2006-P

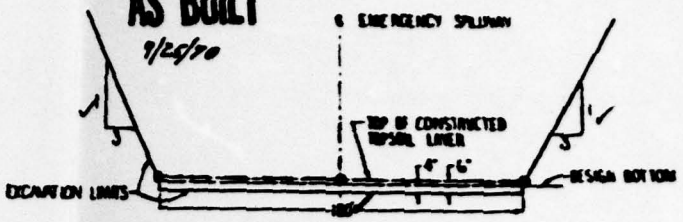
2


SECTION OF CUTOFF TRENCH AT STA. 3+00
(TYPICAL FROM APPROX STATION 2+65 TO 4+00 AND FROM STA 5+75 TO APPROX. STA. 7+20)
SECTION OF CUTOFF TRENCH AT STA 4+25
(TYPICAL FROM STATION 4+00 TO 4+50 AND 3+25 TO 3+75)
TRANSITION FROM 12' TO 30'
SECTION OF CUTOFF TRENCH
(TYPICAL FROM STATION 4+
℄ OF EMERGENCY SPILLWAY
GROUND LINE
STA 3+50 EL 1255.0
STA 4+00 EL 1255.7
STA 5+00 EL 1255.7
STA 5+50 EL 1255.7
TOP OF SETTLED FILL EL 1258.2
ELEV 1252.5
4"
6" TOPSOIL
EXCAVATION LIMITS
180'
TP-1
STRIPPED GROUND LINE
DH-51
22' UPSTREAM
INTERFACE BETWEEN ABUTMENT AND EMBANKMENT SHALL BE NO STEEPER THAN (2) HORIZONTAL TO (1) VERTICAL
℄ OF EMERGENCY SPILLWAY STA 4+77
DH-52
DH-53
DH-54
TP-2
TP-3
TP-4
HORZ SCALE IN FEET
VERT SCALE IN FEET
CUTOFF TRENCH CONSTRUCTION NOTES
1 FINAL DEPTH OF TRENCH TO BE DETERMINED AT TIME OF CONSTRUCTION BY THE ENGINEER
2 EXCAVATE 10' MIN INTO FIRM SHALE WHERE TRENCH BOTTOMS ON SHALE. ALL ROCK EXPOSED IN THE BOTTOM OF TRENCH SHALL BE THOROUGHLY CLEANED OF LOOSE MATERIAL PRIOR TO BACKFILLING OPERATION.
PROFILE ALONG ℄ OF DAM (LOOKING DOWNSTREAM)
DH-204
TP-202
TP-204
TP-206
FLOW
GROUND LINE
Top Of Topsoil
50'
50'
EMERGENCY SPILLWAY DESIGN BOTTOM
LEVEL SECTION
BOTTOM OF EXCAVATION
Top Soil = 6,900 Sq. Yds.
PROFILE ALONG ℄ EMERGENCY SPILLWAY

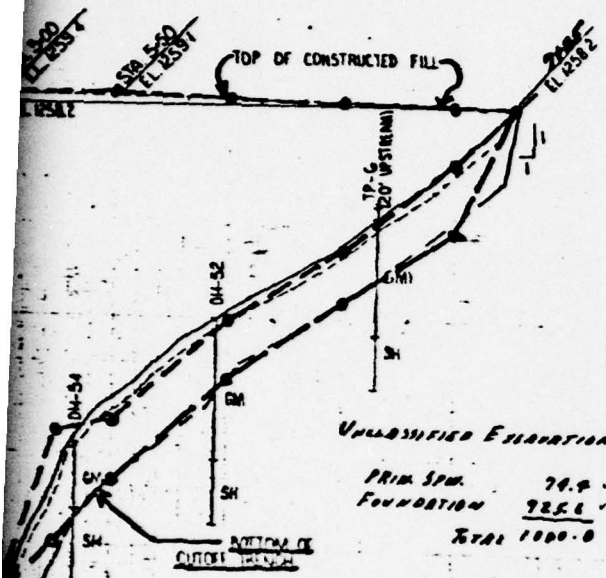
AS BUILT
9/25/70

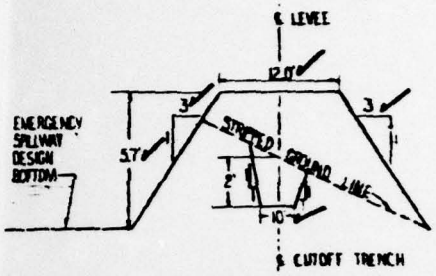


SECTION OF CUTOFF TRENCH AT STA 4+75
(TYPICAL FROM STATION 4+30 TO 5+25)

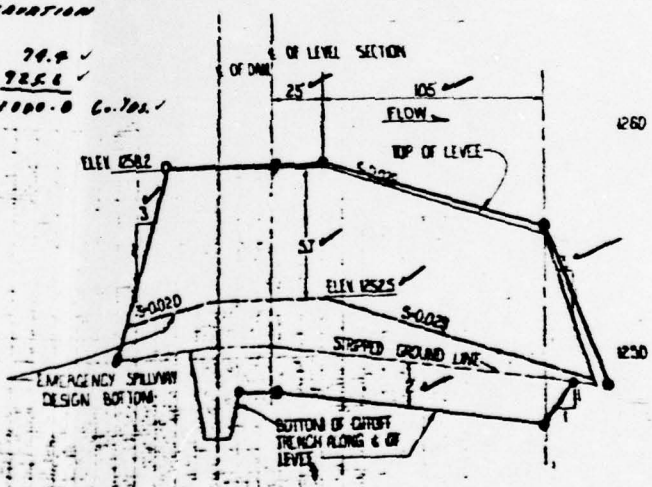


SECTION OF EMERGENCY SPILLWAY AT STA 2+35
TYPICAL FROM STA 2+20 TO APPROX STA 6+25 EXCAVATION TO DESIGN BOTTOM FROM APPROX STA 0+58 TO STA 2+20





SECTION OF LEVEE @ 25.0' DOWNSTREAM FROM ℄ LEVEE SECTION
(TYPICAL FROM DOWN STREAM SLOPE OF DAM TO 130' DOWN STREAM FROM ℄ OF LEVEE SECTION)



PROFILE ALONG ℄ LEVEE

HORZ SCALE IN FEET
VERT SCALE IN FEET

PROFILE SCALE ALONG ℄ LEVEE & EMERGENCY SPILLWAY

Unclassified Excavation

Prim. Spwy.	74.9 ✓
Foundation	925.6 ✓
Total	1000.0 Cu. Yds. ✓

Excavation

Foundation	3892.2 ✓
Core (dam)	1606.8 ✓
Core (levee)	201.9 ✓
Toe drain	64.5 ✓
Rubble Rock Outlet	936.9 ✓
Inlet	18.2 ✓
Collar Bottoms	1.0 ✓
Total	6060.4 Cu. Yds. ✓

Earth Fill

Dam & Foundation	48055.8 ✓
Levee	1500.9 ✓
Core (dam)	1606.8 ✓
Core (levee)	201.9 ✓
Prim. Spwy.	30.6 ✓
Subtotal	51437.8 ✓
Deductions	280.0 ✓
Total	51157 Cu. Yds. ✓

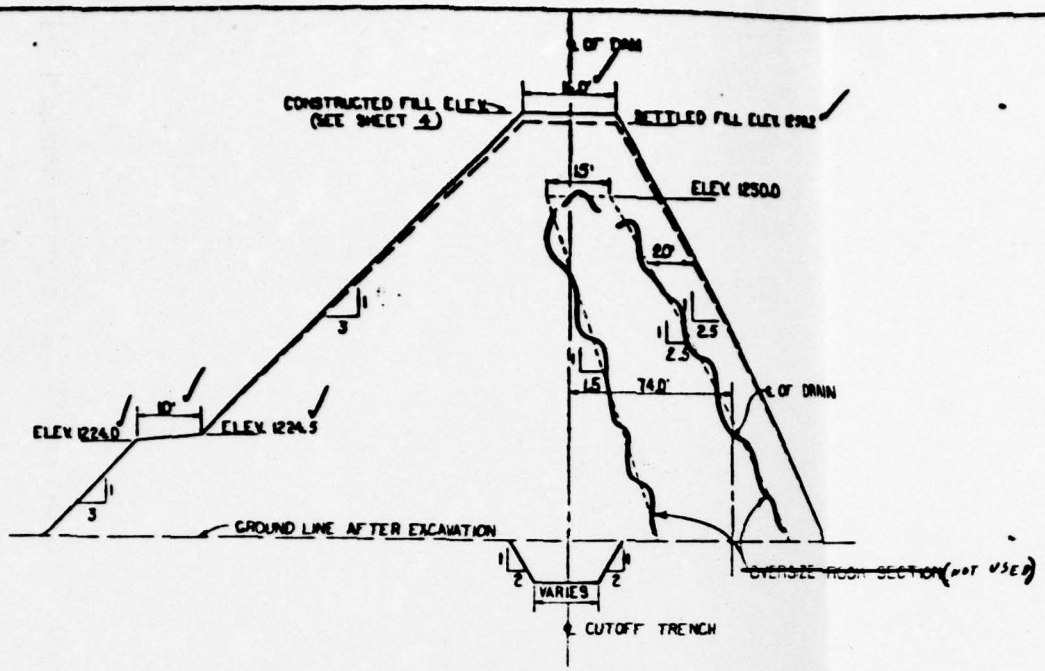
NANTICOKE CREEK WATERSHED PROJECT
SITE 8
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK

CUTOFF TRENCH & EMERGENCY SPWY EXCAVATION

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	D. ZOGRAFOS	1/67	
Drawn	B. FELTON	1/67	
Traced			
Checked	B.J.S.	2/67	NY-2006-P

2



SECTION OF DAM AT STA. 4+77 (TYPICAL FROM APPROX. STA. 2+58 TO 7+30)

(NOT TO SCALE)

MATERIAL 1/
SILTY GRAVEL LABELLED MI… SHEET 15 AND REPRESENTE… TP-202 FROM 2… TP-203 FROM 2… TP-104 FROM 1…

1/ THE PLA…

2/ A. MAXI… POWE…
B. MAXI… "OVER… BE …

3/ A. MAXI…
B. USE …

4/ WATER …

5/ A. FOR …
B. USE … CONT…

1. THE FOU… COMPACT…
2. EXCAVATE … AND USE…
3. TOPSOIL … BE INCO…

PRINCIPAL SPILLWAY EXCAVATION DETAILS

1. EXCAVATE THROUGH WEATHERED ROCK ALONG PRINCIPAL SPILLWAY.
2. EXCAVATE 12" MIN. INTO FIRM SHALE WHERE TRENCH BOTTOM IS ON SHALE. ALL ROCK EXPOSED IN THE BOTTOM OF TRENCH SHALL BE THOROUGHLY CLEANED OF LOOSE MATERIAL PRIOR TO PLACEMENT OF CONCRETE AND BACKFILLING OPERATIONS.

EXCAVATE MIN. 6" INTO ROCK

PRIN…

1230

1220

1210

RESERVOIR DRAIN INVERT ELEV. 1215.50

TR-301

ELEV. 1218.00

RISER FLOOR ELEV. 1215.00

(7) REINF. CONC. ANTI-SEEP COLLARS @ 24.0' C.C.

STRIPPED GROUND LINE

℄ OF DAM

136.0'

90.0°

CMP

ML

SM

BOTTOM OF EXCAVATION

PROFILE ALONG ℄ OF PRINCIPAL SPILLWAY

0 1 2 4 8

VERT. SCALE IN FEET

0 5 10 20 40

HORIZ. SCALE IN FEET

AS BUILT
9/25/70

EARTH FILL REQUIREMENTS

MATERIAL 1/	MAX. 2/ ROCK SIZE	MAX. LIFT THICK 3/	MINIMUM WATER CONTENT 4/	COMPACTION 5/	
				CLASS	DEFINITION
SILTY GRAVEL LABELLED MATERIAL "A" ON SHEET 15 AND REPRESENTED BY: TP-202 FROM 2.0' TO 10.0' TP-205 FROM 2.0' TO 10.0' TP-104 FROM 1.0' TO 10.0'	6"	9"	2 PERCENTAGE POINTS BELOW OPTIMUM MOISTURE	A	95% MAX. DENSITY BY ASTM D698 METHOD A

1/ THE PLACEMENT TABLE INDICATES ESTIMATED USE OF MATERIAL.

2/ A. MAXIMUM ROCK SIZE PLACED IN BACKFILL COMPACTED BY MEANS OF HAND TAMPING OR MANUALLY DIRECTED POWER TAMPERS OR PLATE VIBRATORS SHALL BE 3".
B. MAXIMUM ROCK SIZE OF 12" DUMPED IN THE EARTH FILL CAN BE RAKED TO THE PORTION OF THE DAM LABELLED "OVERSIZE ROCK SECTION" AS SHOWN ON THIS SHEET. OVERSIZE MATERIAL (6" TO 12") IN THIS SECTION SHALL BE GRADED SO THAT THE LARGER ROCK ARE PLACED TOWARD THE DOWNSTREAM SLOPE.

3/ A. MAXIMUM LIFT THICKNESS PRIOR TO COMPACTION.
B. USE 18" LIFTS IN AREAS WHERE OVERSIZE MATERIAL (6" TO 12") IS PLACED.

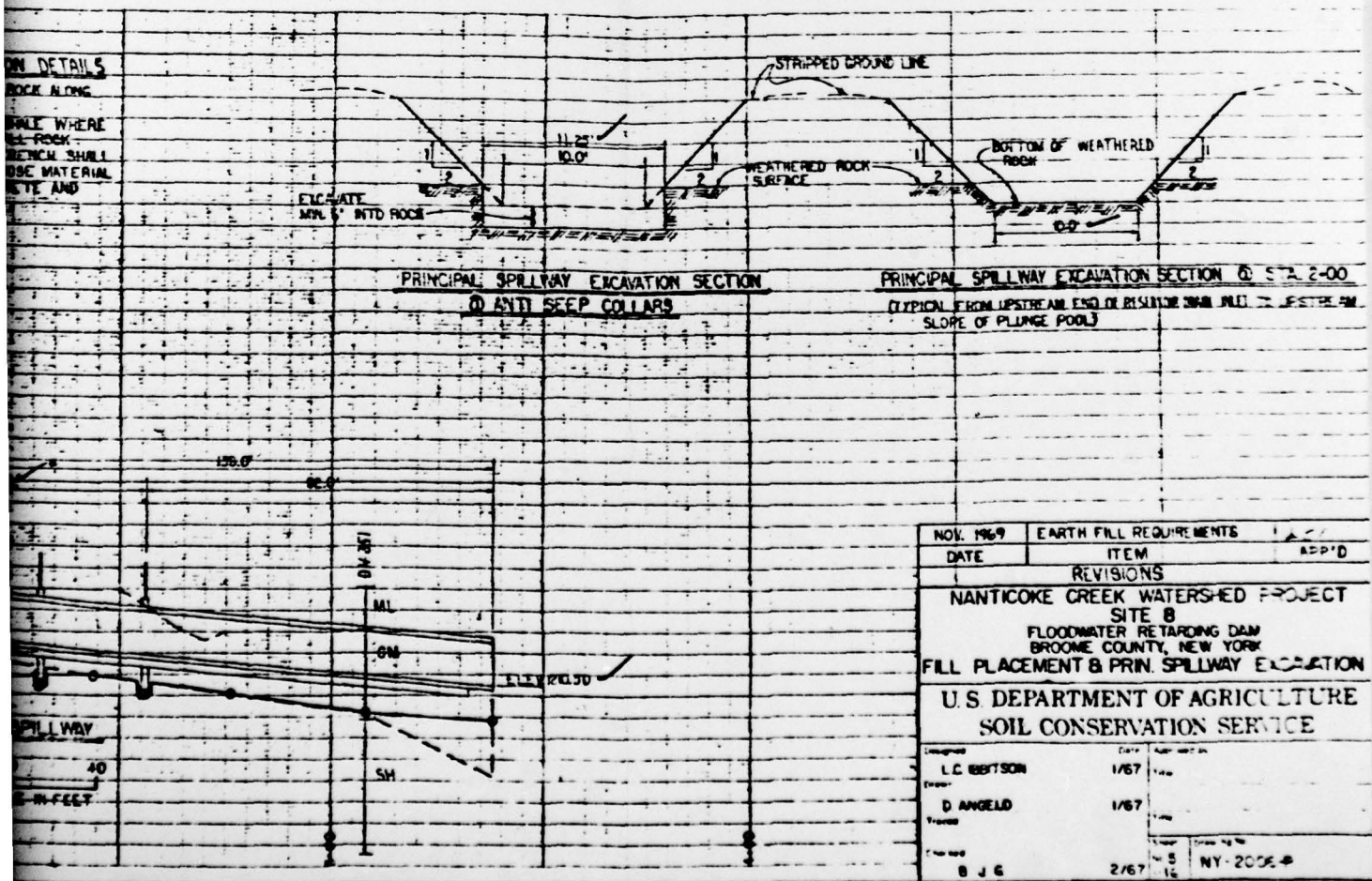
4/ WATER CONTENT AT TIME OF COMPACTION.

5/ A. FOR TYPICAL COMPACTION CURVES SEE SHEET 15.
B. USE CLASS V COMPACTION (SEE CONSTRUCTION SPECIFICATION 5) IN AREAS OF THE OVERSIZE ROCK SECTION CONTAINING OVERSIZE MATERIAL (6" TO 12").

CONSTRUCTION DETAILS

1. THE FOUNDATION SURFACE THROUGH THE BASE AREA OF THE DAM SHALL BE SCARIFIED TO A DEPTH OF 6" AND COMPACTED PRIOR TO PLACEMENT OF FILL MATERIAL.
2. EXCAVATED MATERIAL (REPRESENTED BY TP 501 FROM 2.5' TO 9.0') IN FOUNDATION TRENCH SHALL BE STOCKPILED AND USED AS EARTH FILL ADJACENT TO THE DRAIN FILL MATERIAL. MINIMUM COVERING OF THIS MATERIAL = 2.0'
3. TOPSOIL THAT IS SUITABLE FOR USE AND NOT USED ON THE SPECIFIED AREA OF THE EMERGENCY SPILLWAY SHALL BE INCORPORATED WITHIN THE SLOPES OF THE EARTH FILL AS DIRECTED BY THE ENGINEER.

(NOT USED)



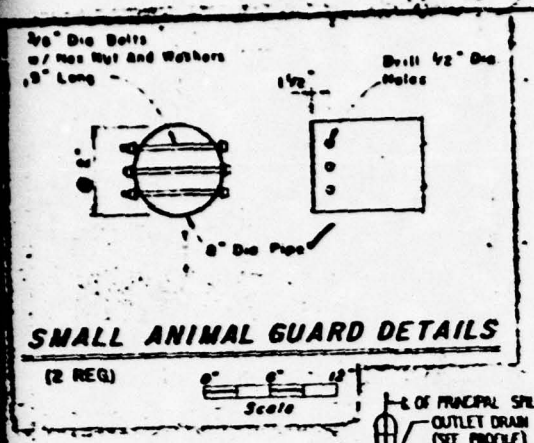
NOV. 1969	EARTH FILL REQUIREMENTS	
DATE	ITEM	APP'D

REVISIONS

NANTICOKE CREEK WATERSHED PROJECT
SITE 8
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
FILL PLACEMENT & PRIN. SPILLWAY EXCAVATION

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

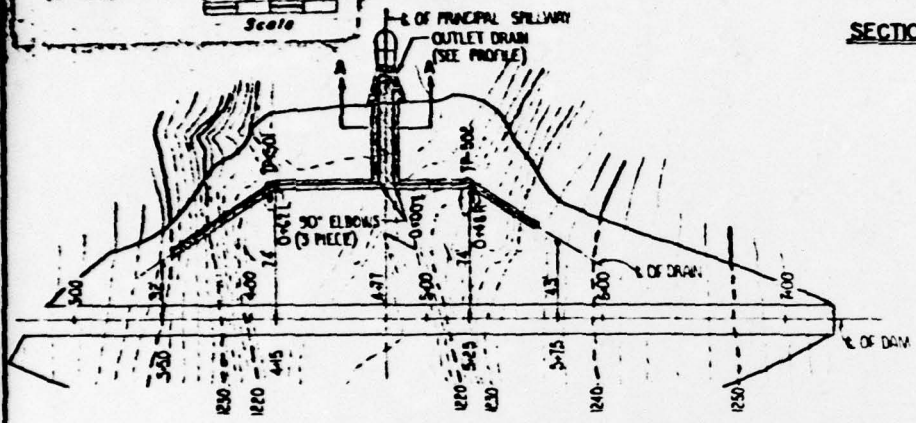
L.C. GIBTSON	1/67	
D ANGELO	1/67	
B J G	2/67	NY-2006-8



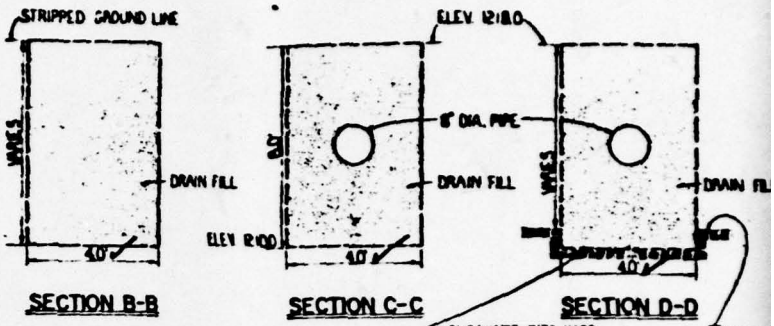
SMALL ANIMAL GUARD DETAILS

(2 REQ)

Scale



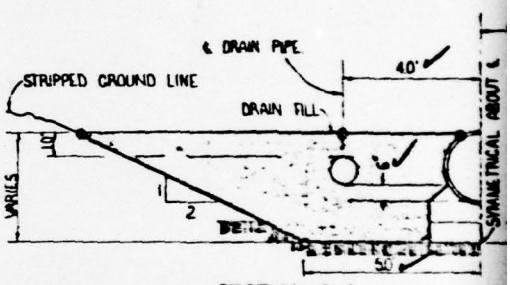
PLAN VIEW



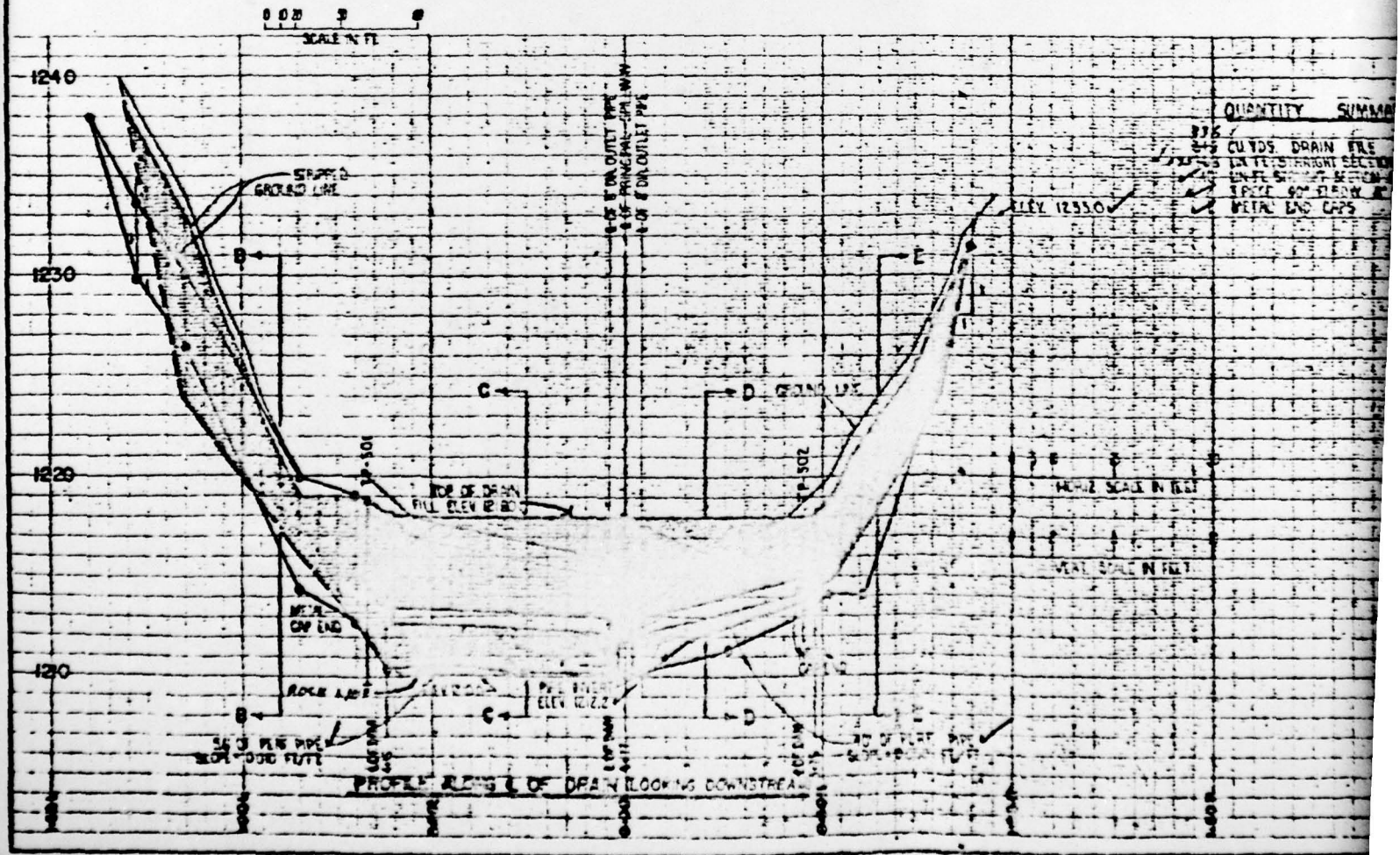
SECTION B-B

SECTION C-C

SECTION D-D



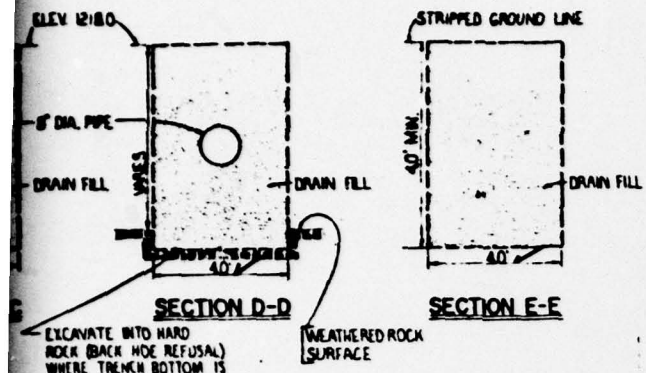
SECTION A-A



AS BUILT 9/25/70

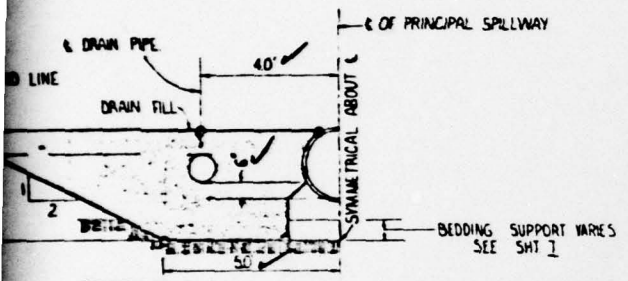
DRAINAGE SYSTEM NOTES

1. ALL DRAIN PIPE SHALL CONFORM TO SPECIFICATION 110 AND SHALL BE 8" DIA., SHAPE I; CLASS I (ANNULAR CORRUGATIONS) OR CLASS II (HELICAL CORRUGATIONS); TYPE-A (FULLY BITUMINOUS COATED) PIPE.
2. USE A MINIMUM OF 12" OF DRAIN FILL AROUND PIPES.
3. THE PROFILES AT THE BOTTOM OF ALL EXCAVATIONS AS SHOWN ARE ONLY APPROX. THE REQUIRED FINISHED GRADES WILL BE ESTABLISHED IN THE FIELD AT THE TIME OF CONSTRUCTION BY THE ENGINEER.
4. DRAIN FILL AT AREA OF DOWN STREAM SLOPE OF DAM TO BE COVERED WITH 18" RIPRAP.

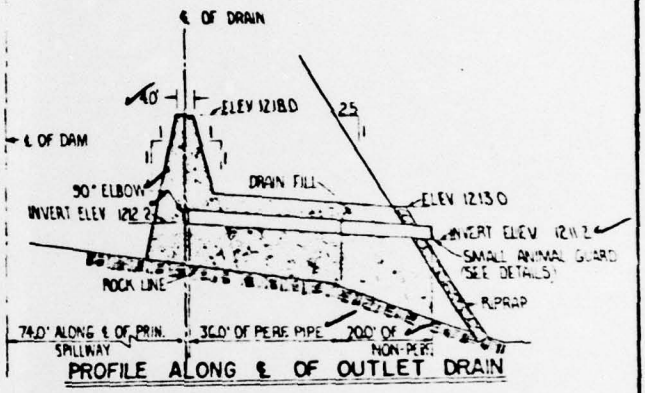


SECTION D-D

SECTION E-E



SECTION A-A

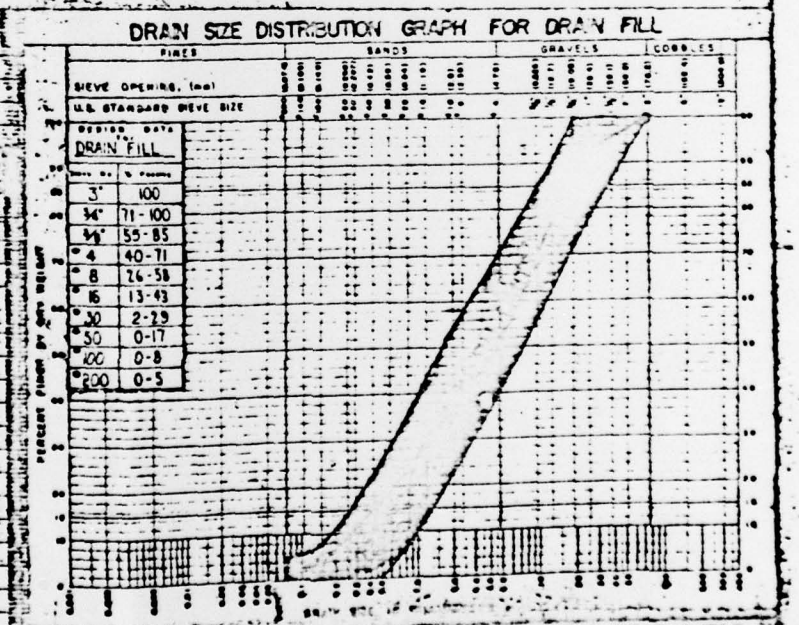


PROFILE ALONG ℄ OF OUTLET DRAIN

QUANTITY SUMMARY

336 CU YDS. DRAIN FILL
345 LIN FT STRAIGHT SECTION OF PERFORATED
LIN FT
1 PIPE 60° ELBOW 8" DIA INTERNAL
METAL END CAPS

DRAIN SIZE DISTRIBUTION GRAPH FOR DRAIN FILL

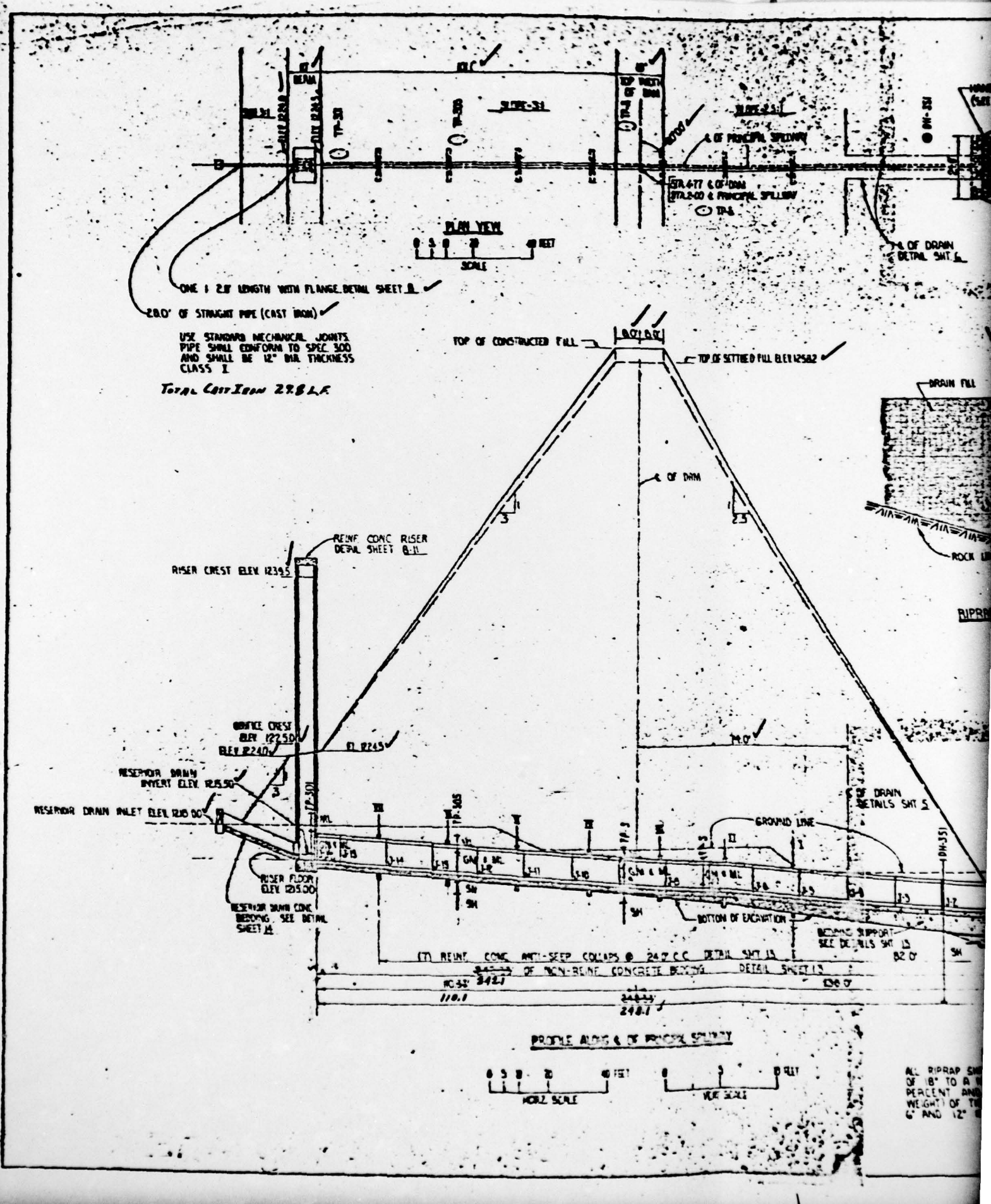


NANTICOKE CREEK WATERSHED PROJECT
SITE 8
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
DRAINAGE SYSTEM

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

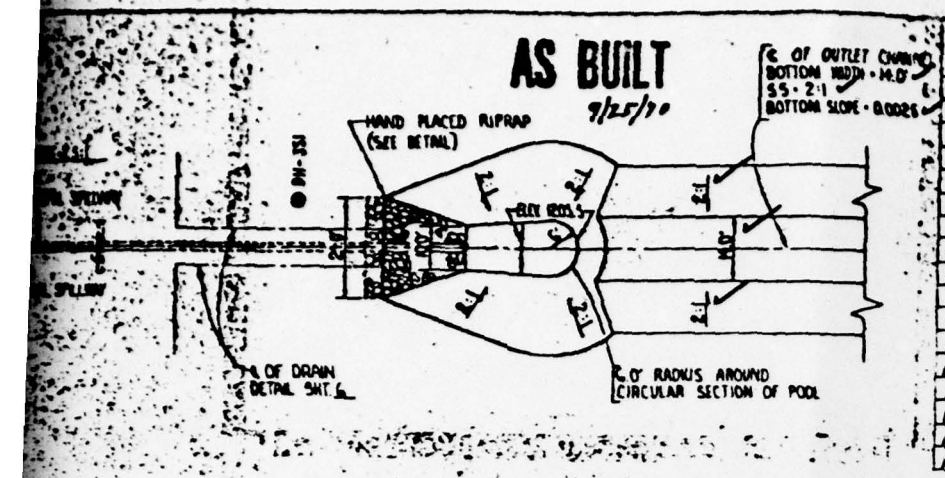
L.C. IBBITSON 1/67
BRUCE FELTON 1/67
WM YOLTON 1/67
B J G 2/67
NY-20[illegible] P

2


PLAN VIEW
SCALE
ONE 1 2.0' LENGTH WITH FLANGE DETAIL SHEET 11
28.0' OF STRAIGHT PIPE (CAST IRON)
USE STANDARD MECHANICAL JOINTS PIPE SHALL CONFORM TO SPEC 300 AND SHALL BE 12" MIN THICKNESS CLASS I
TOTAL COST FROM 29.8 L.F.
TOP OF CONSTRUCTED FILL
TOP OF SETTLED FILL ELEV 125.82
℄ OF DAM
REINF CONC RISER DETAIL SHEET 8-11
RISER CREST ELEV 123.95
ORIFICE CREST ELEV 122.50
ELEV 122.40
EL 122.45
RESERVOIR DRAIN INVERT ELEV 121.50
RESERVOIR DRAIN INLET ELEV 120.00
RISER FLOOR ELEV 120.00
RESERVOIR DRAIN CONC BEDDING, SEE DETAIL SHEET 14
GROUND LINE
BOTTOM OF EXCAVATION
(T) REINF CONC ANTI-SEEP COLLARS @ 24.7 C.C. DETAIL SHT 13
OF NON-REINF CONCRETE BEDDING DETAIL SHEET 13
110.1
248.1
PROFILE ALONG ℄ OF PRINCIPAL SPILLWAY
HORIZ SCALE
VERT SCALE
DRAIN FILL
ROCK
RIPRAP
℄ OF DRAIN DETAIL SHT 5
DETAILS SHT 5
BEDDING SUPPORT SEE DETAILS SHT 13
82.0'
14.0'
3
2.5
1

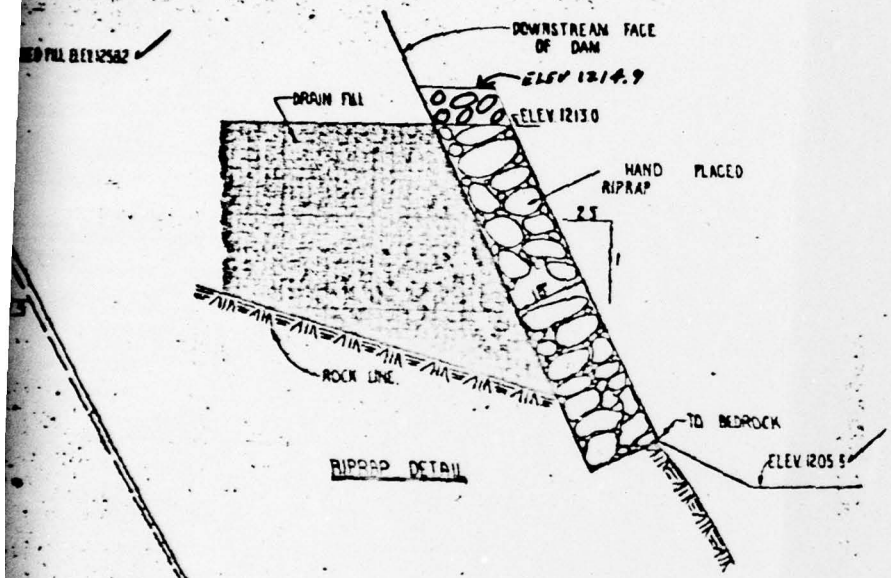
AS BUILT

9/25/90



ZONE	JOINT	DIST FROM OUTLET	INVERT OF 24" DIA PIPE	SLOPE
	OUTLET	0	1205.50	0.0025
	J-1	16	1205.90	
	J-2	32	1206.07	
	J-3	48	1206.39	
	J-4	64	1206.66	
	J-5	80	1206.98	
	J-6	96	1207.30	
	J-7	112	1207.62	
	J-8	128	1207.87	
	J-9	144	1208.16	
	J-10	160	1208.46	
	J-11	176	1208.76	
	J-12	192	1209.09	
	J-13	208	1209.35	
	J-14	224	1209.69	
	J-15	240	1209.93	
	J-16	248	1210.08	

ABOVE DIMENSIONS FOR LENGTHS OF PIPE ARE BASED ON NOMINAL LENGTHS AND DO NOT INCLUDE CREEP.



RIPRAP DETAIL

COLLAR	DIST FROM OUTLET	INVERT OF 24" DIA PIPE
I	82	1212.02
II	106	1212.46
III	130	1212.90
IV	154	1213.35
V	178	1213.79
VI	202	1214.23
VII	226	1214.68

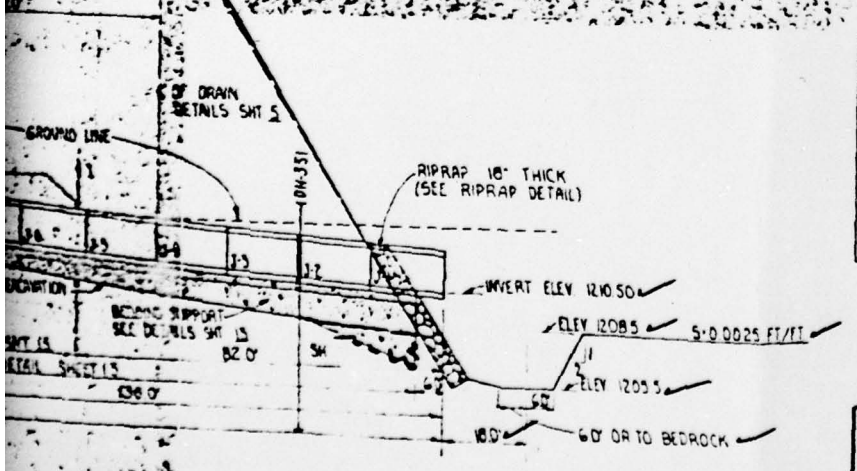
24" REINFORCED CONCRETE PIPE STRENGTH REQUIREMENTS

1 PRESSURE HEAD 45'

2 LOAD 33,381 LBS PER LIN FT BASED ON O.D OF 2.5'

3 MIN. 3 EDGE BEARING STRENGTH FOR 0.001" CRACK 12,599 LBS PER LIN FT FOR PRE-STRESSED PIPE (AWWA C-301)

WHERE THE PIPE FURNISHED HAS AN OUTSIDE DIAMETER GREATER THAN THAT CALLED FOR ON THE PLANS, THE THREE EDGE BEARING STRENGTH OF THE PIPE FURNISHED MUST BE EQUAL TO OR GREATER THAN THE SPECIFIED THREE EDGE BEARING STRENGTH MULTIPLIED BY THE RATIO OF THE OUTSIDE DIAMETER OF THE PIPE FURNISHED TO THE OUTSIDE DIAMETER SPECIFIED



FABRICATION INSTRUCTIONS

(15) 14.0' SECTIONS
(1) 8.0' SECTION
ONE (1) SPIGOT RING WALL FITTING FOR 10' WALL

(12) 20.0' SECTIONS
(1) 8.0' SECTION
ONE (1) SPIGOT RING WALL FITTING FOR 10' WALL

PIPE SUPPLIERS NOTE
CAST OUTSIDE OF SPIGOT RING WITH CONCRETE ON ONE 6.0' SECTION

PIPE SUPPLIERS NOTE
CAST OUTSIDE OF SPIGOT RING WITH CONCRETE ON ONE 20.0' SECTION

RIPRAP DETAILS

ALL RIPRAP SHALL BE GRADED FROM A MAX SIZE OF 18" TO A MIN SIZE OF 3". A MIN OF FORTY (40) PERCENT AND A MAX OF SIXTY (60) PERCENT (BY WEIGHT) OF THE ROCK RIPRAP SHALL BE BETWEEN 6" AND 12" IN SIZE

13.0 Cu Yds RIPRAP

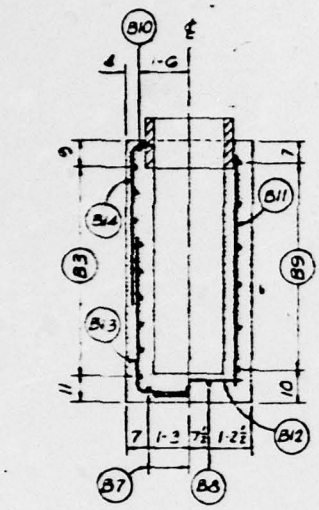
NANTICOKE CREEK WATERSHED PROJECT
SITE 5
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
PLAN PROFILE OF PRINCIPAL SPILLWAY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

D ZOGRAFOS 1/87
W E GRADO JR 1/87

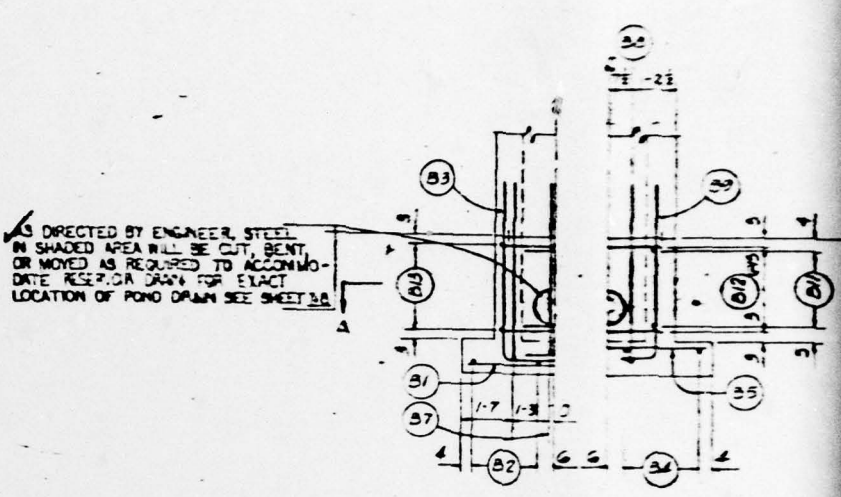
NY-2006-P

2



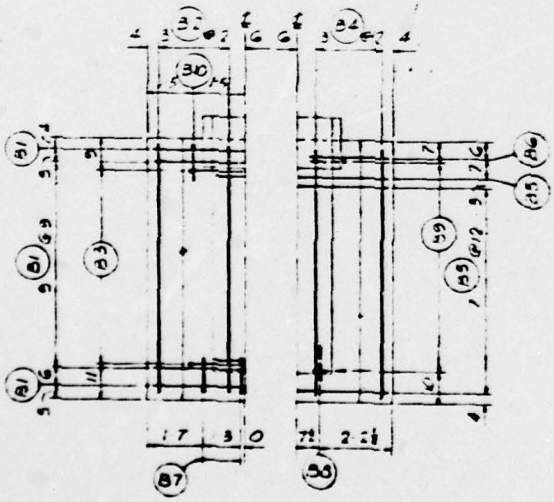
OUTSIDE FACE INSIDE FACE

SECTION A-A



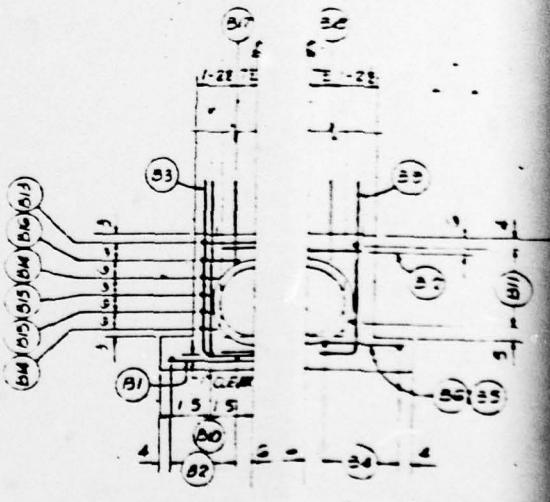
OUTSIDE FACE INSIDE FACE

UPSTREAM ELEVATION



STEEL 3" FROM BOTTOM OF FOOTING STEEL 2" FROM TOP OF FOOTING

FOOTING PLAN

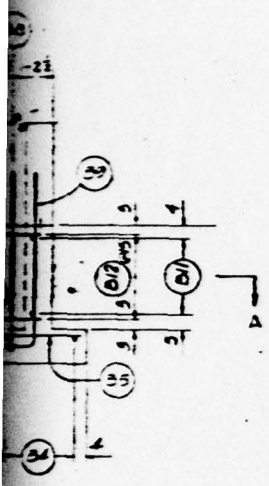


OUTSIDE FACE INSIDE FACE

DOWNSTREAM ELEVATION

0 2 4 6
SCALE IN FEET

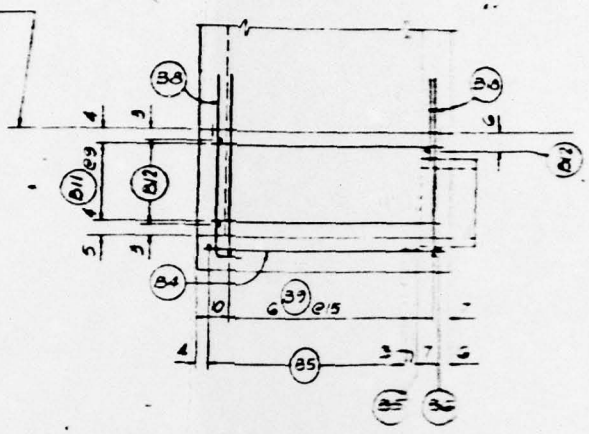
AS BUILT
9/25/70



INSIDE FACE

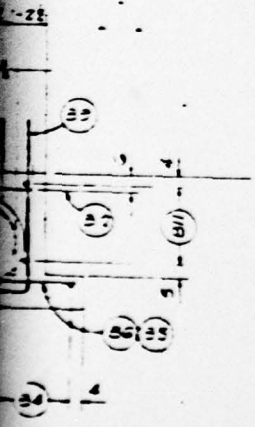
EVATION

PLATE CONSTRUCTION JOINT



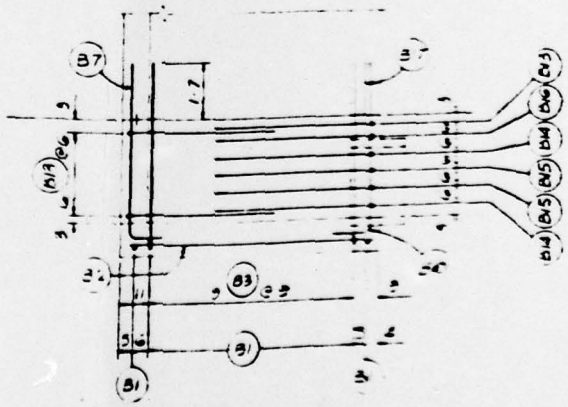
STEEL 2" FROM INSIDE FACE OF RISER AND 2" FROM TOP OF FOOTING

SIDEWALL ELEVATION



INSIDE FACE

EVATION



STEEL 2" FROM OUTSIDE FACE OF RISER AND 9" FROM BOTTOM OF FOOTING

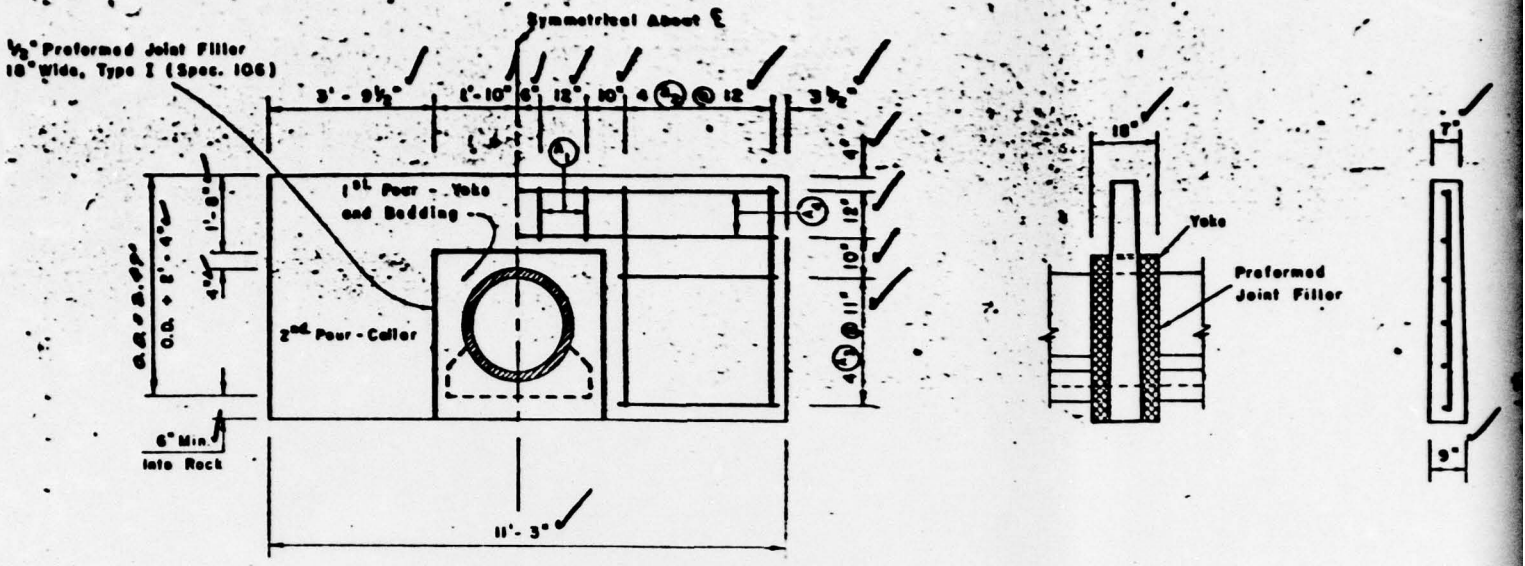
SIDEWALL ELEVATION

NANTICOKE CREEK WATERSHED PROJECT
SITE 6
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
RISER STRUCTURAL DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

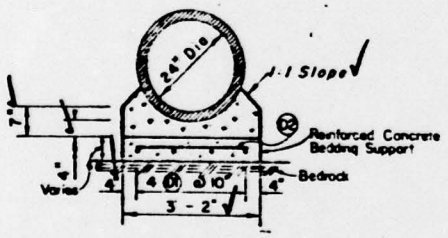
B ZOGRAFOS

NY 2006-P



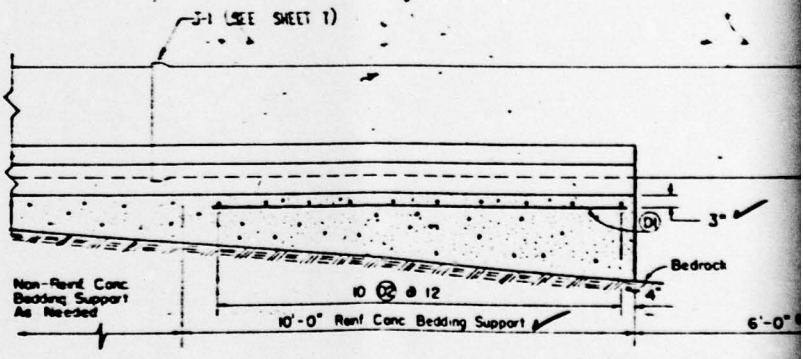
REINFORCED CONCRETE ANTI - SEEP COLLAR

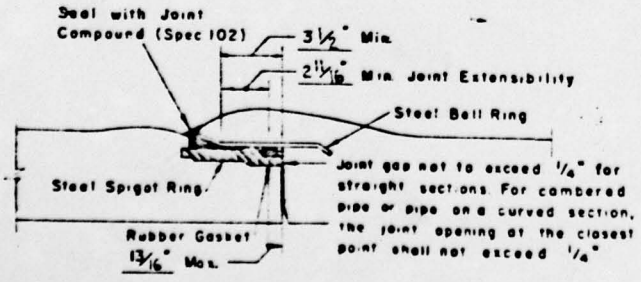
7 - Req'd



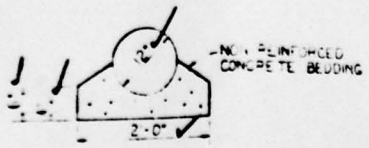
CONCRETE BEDDING

(WITH REINFORCED CONC BEDDING SUPPORT)





REINFORCED CONCRETE WATER PIPE JOINT



RESERVOIR DRAIN CONCRETE BEDDING

BAR TYPE

Length ①

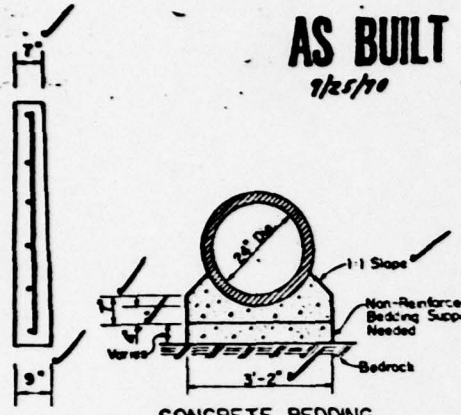
AS BUILT
9/25/70

ANTI-SEEP COLLAR STEEL SCHEDULE

Mark	Size	Length	Type	Quan. / Collar	Total Quan.	Total Length
A-1	4	1-3	1	4	28	35-0
A-2	4	4-9	1	8	56	265-0
A-3	4	3-3	1	8	56	182-0
A-4	4	10-9	1	2	14	150-6

BEDDING SUPPORT STEEL SCHEDULE

Mark	Size	Length	Type		Total Quan.	Total Length
D-1	5	9-3	1		4	37-0
D-2	5	2-8	1		10	26-8



CONCRETE BEDDING
(WITH NON-REINFORCED CONC. SECTION OF BEDDING SUPPORT)

TOTAL QUANTITIES-COLLARS, BEDDING & BEDDING SUPPORT

STEEL

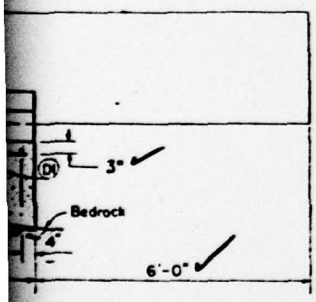
No. 4 Bar 633-6 = 423 Lbs.
No. 5 Bar 63-8 = 66 Lbs.

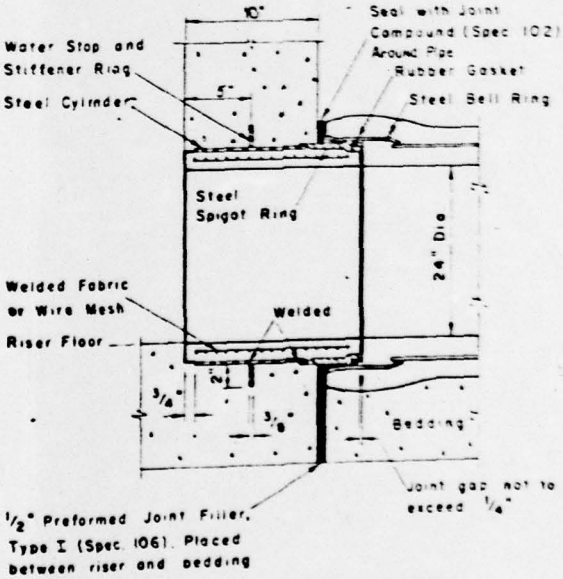
ADDITIONAL NO. 4 BARS USED WHERE ROCK EXCAV. IS 1 FOOT LOWER THAN DESIGN

CONCRETE 189-5 = 105 Lbs.

Reinforced 11.7 Cu. Yds.
Non-Reinforced 5.9 Cu. Yds.

CONSTRUCTION DETAILS SHEET 8





SPIGOT RING WALL FITTING

NANTICOKE CREEK WATERSHED PROJECT
SITE 8
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
CONDUIT DETAILS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed L.C. IBBETSON 1/67
Drawn D. BINGELO 2/67
Traced
Checked B.J.G.
Approved
Date
Sheet 24 of 43
NY-2006-P

DRILL HOLE LOGS

BH ..1, Emer. Spill., Elev. 1234.4

7		0.0	Topsoil
		1.5	
10	(CH)		Material A
10			
12			
12			
13			
13			
11			
13			
		25.0	

BH ..54, Emer. Spill., Elev. 1261.3

9		0.0	Topsoil
		1.0	
88	(CH)		Material A
56			
37			
57			
88			
31			
88			
57			
		21.5	

NOTE: Some indications of sand, or sandier till in the 12' depth zone.

BH 355, Emer. Spill., Elev. 1260.4

8		0.0	Topsoil
		1.0	
88	(CH)		Material A
34			
88			
45			
88			
32			
88			
43			
		21.0	

BH 351, Prin. Spill., Elev. 1215.1

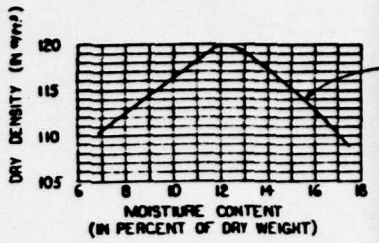
		0.0	
	(ML)		Material M
		2.0	
88	(GM)		Material D
		6.2	
88	(SM)		Material C
1888			
1888			
		12.5	

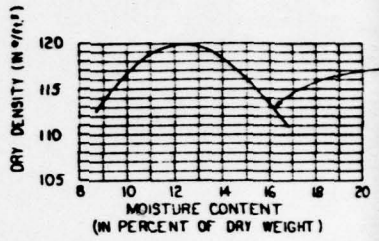
NOTE: Horizons shown from 0-6.2 inferred from log of T.P. 302.

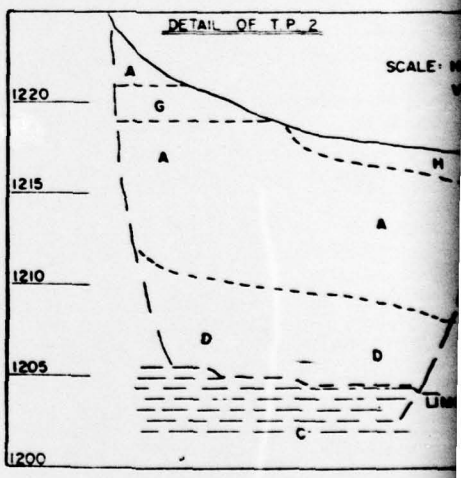
BH 352, Prin. Spill., Elev. 1218.3

		0.0	
2			Material M
11	(ML)		
Ref.			
		3.6	
88			Material C
1888	(SM)		
995			
		10.5	

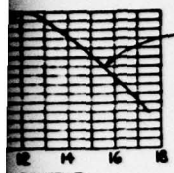
TYPICAL COMPACTION CURVES







PACTION CURVES

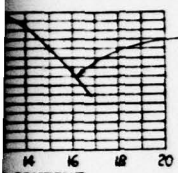


DRY DENSITY <4 MATERIAL

COMPACTION CURVE FOR MATERIAL FROM TP-202 2' TO 10' DEEP LABORATORY CLASSIFICATION CL

12 14 16 18

CONTENT
F DRY WEIGHT)



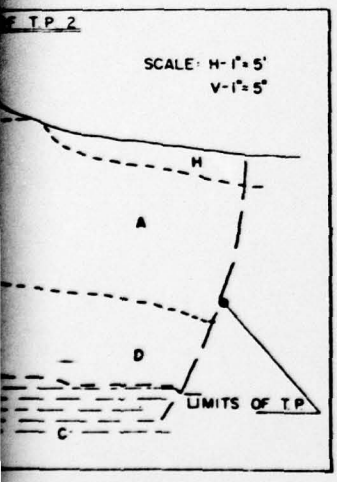
DRY DENSITY <4 MATERIAL

COMPACTION CURVE FOR MATERIAL FROM TP-205 2' TO 10' DEEP LABORATORY CLASSIFICATION CL

14 16 18 20

CONTENT
F DRY WEIGHT)

F TP 2



LEGEND

TEST HOLE NUMBERING SYSTEM

Centerline of dam	1 - 99
Borrow area	101 - 199
Emergency spillway	201 - 299
Centerline of outlet structure	301 - 399
Stream channel	401 - 499
Relief wells	501 - 599

UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS

GW	Well graded gravels; gravel-sand mixtures
GP	Poorly graded gravels
GM	Silty gravels; gravel-sand-silt mixtures
GC	Clayey gravels; gravel-sand-clay mixtures
SW	Well graded sands; sand-gravel mixtures
SP	Poorly graded sands
SM	Silty sands; sand-silt mixtures
SC	Clayey sands; sand-clay mixtures
ML	Silts; silty, v. fine sands; sandy or clayey silts
CL	Clays of low to medium plasticity; silty, sandy or gravelly clays
CH	Clays of high plasticity; fat clays
MH	Elastic silts; micaceous or diatomaceous silts
OL	Organic silts and organic silty clays of low plasticity
OH	Organic clays or silts of medium to high plasticity

BEDROCK SYMBOLS

B	Basalt	Sc	Schist
Cn	Chalcedony	Sh	Shale
Gr	Granite	Si	Siltstone
Ls	Limestone	Sl	Slate
Ma	Marble	Ss	Sandstone

SAMPLES

DS	Disturbed
US	Undisturbed
Core	RX Core

KEY TO DRILL HOLE (DH) LOGS

N = 22 — Number of blows required for 1-ft. standard penetration, using 1.0" O.D. split barrel sampler, 140 lb. hammer, and 30" drop. ASTM D 1586.

9.0 Depth in hole (ft.)

CL Unified Soil Classification System

12.0

D.B.L. Dry barrel sampler

RB Roller bit to advance hole by wash boring

17.0 Depth in hole

RX Rock core, 2-1/8" diameter

73% Percent rock core recovery in wash drill run

90% Bedrock symbol

W.L. (date) Water Level

NANTICOKE CREEK WATERSHED PROJECT
SITE 8
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date	Approved by	
Drawn	B.S. ELLIS	Title	
Traced		Title	
Checked	B.A.G. 2/87	Scale	NY-2006-P

FORM SCS 313

MATERIAL DESCRIPTIONS

A

Gravel, silty - approximately 40 percent fines, 20 percent sands and 40 percent + 6 - occasional 6" - 12" subangular flags - brown, sometimes grading to a slightly olive gray with depth - moist to wet with depth - slowly permeable - glacial till - very dense. (GM)

B

Gravel, or silt (typically an assorted alluvium) frequent logs and other organic remains - brown and sometimes gray - generally saturated - very slowly to moderately permeable - recent alluvium and reworked till - generally soft or loose. (GM & ML)

C

Shale - grading toward a siltstone - moderately thin bedded with some clay seams near the surface - weathered approximately a foot - dense and hard with depth - average water loss per 5' of BH hole: 10 psi - 1gpm, 20 psi - 1.7 gpm - gray to grayish brown - occasional minor artesian pressures. Sh

D

Gravel, silty - approximately 25 percent fines, 25 percent sands and 50 percent + 6 - some 6" - 12" flagy cobbles - gray - saturated - slowly permeable - glacial till - dense. (GM)

E

Silt, some sand (10-15 percent) - brown - moist to wet - slowly permeable - glacial lacustrine - soft to medium density. (ML)

F

Gravel, some sand and few fines - many 18" - 24" flagy cobbles and fairly well graded ("nest" of boulders?) - brown - moist - moderate to rapidly permeable - very dense (bouldery consistency). (GM)

G

Silt, very sandy - brown - moist to wet - moderately permeable - glacial lacustrine - medium density. (ML)

H

Silt, some sand and high in organic matter (floodplain silt and topsoil mixture) - dark brown - moist - slowly permeable - recent alluvium - soft to medium density. (ML)

BACKHOE PIT LOGS

TP 1, C/L , Elev. 1240.2

0	1.0	Topsoil	
1.0	8.0	Material A	(GM)
8.0	12.0	Material F	(GM)

Note: This material is essentially the same as the predominant brown till on this site, except that it has a considerable concentration of cobbles and boulders. Possibly some sort of ice-contact feature.

TP2, C/L, Elev. 1219.2

NOTE: SEE PROFILE ON SHEET II

CL

TP 3, C/L, Elev. 1216.3

0	1.0	Topsoil - Material H	(ML)
1.0	4.8	Material B	(GM & ML)
4.8	+	Material C	(Sh)

TP 4, C/L, Elev. 1216.4

0	1.0	Topsoil - Material H	(ML)
1.0	3.0	Material B	(GM & ML)
3.0	+	Material C	(Sh)

TP 5, C/L, Elev. 1215.3

0	2.3	Material B	(GM & ML)
2.3	+	Material C	(Sh)

TP 6, C/L, Elev. 1250.0

0	1.0	Topsoil	
1.0	11.0	Material A	(GM)
		Note: Slight seepage a foot or so above rock surface.	
11.0	+	Material C	(Sh)

TP [illegible], Narrow, Elev. 1271.1

	1.0	Topsoil	
1.0	10.0	Material A	(GM)

TP [illegible], Narrow, Elev. 1267.0

0	1.0	Topsoil	
1.0	10.0	Material A	(GM)

TP [illegible], Narrow, Elev. 1260.0

0	1.0	Topsoil	
1.0	12.0	Material A	(GM)

TP [illegible], Narrow, Elev. 1271.1

0	1.0	Topsoil	
1.0	11.5	Material A (B.S. [illegible].1)	(GM)

TP [illegible], Narrow, Swift, Elev. 1258.1

0	1.0	Topsoil	
1.0	11.5	Material A	(GM)

TP [illegible], Narrow, Swift, Elev. 1268.0

0	1.0	Topsoil	
1.0	11.5	Material A (B.S. [illegible].1)	(GM)

TP [illegible], Narrow, Swift, Elev. 1267.9

0	1.0	Topsoil	
1.0	10.5	Material A	(GM)

TP [illegible], Narrow, Swift, Elev. 1262.0

0	1.0	Topsoil	
1.0	12.0	Material A	(GM)

TP [illegible], Narrow, Swift, Elev. 1260.9

0	1.0	Topsoil	
1.0	12.0	Material A (B.S. [illegible].1)	(GM)

TP [illegible], Narrow, Swift, Elev. 1252.4

0	1.0	Topsoil	
1.0	12.5	Material A - very minor seepage at the 6' depth	(GM)

CL

TP [illegible], Prair. Swift, Elev. 1219.1

0	1.5	Topsoil (Floodplain silt) - Material H	
1.5	3.5	Material B	(ML)
3.5	+	Material C	(GM & ML) (Sh)

TP [illegible], Prair. Swift, Elev. 1216.3

0	2.0	Topsoil (Floodplain silt) (B.S. [illegible].1)	
		Material H	
2.0	4.7	Material B	(ML) ML
4.7	+	Material C	(GM) (Sh)

TP [illegible], Prair. Swift, (Beyler Channel), Elev. 1214.2

0	1.5	Topsoil (Floodplain silt)	
		Material H	
1.5	4.0	Material B	(ML)
4.0	7.0	Material A, except drab color (B.S. [illegible].1)	(GM) (GM)

TP [illegible], Prair. Swift, (Beyler Channel) Elev. 1212.7

0	1.0	Topsoil	
1.0	3.5	Material H, some Material B mixed in.	(GM & ML)
3.5	6.0	Material H (B.S. [illegible].1)	(ML) ML
6.0	7.5	Material A, except drab color	(GM)

TP [illegible], Prair. Swift, Elev. 1217.4

0	1.5	Topsoil (Floodplain silt)	
		Material H	
1.5	4.8	Material B	(ML)
4.8	5.0	Material C (weathered)	(GM & ML)
5.0	+	Material C	Sh (Sh)

TP [illegible], Prair. Loam, Elev. 1216.7

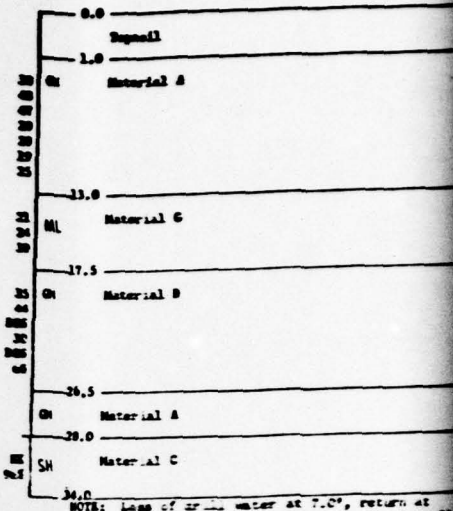
0	2.5	Material B (B.S. 501.1)	(GM & ML) GM
2.5	9.0	Material B (quite loose in place and saturated - some seepage at bases of pit showing minor caving) (B.S. 501.2)	(GM) GM

TP [illegible], Prair. Loam, Elev. 1227.5

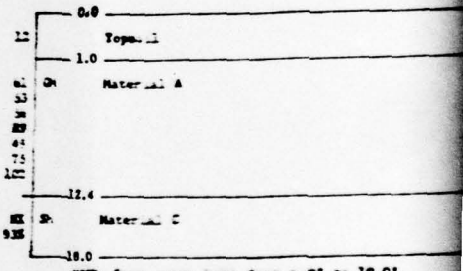
0	1.0	Topsoil	
1.0	2.-	Material A	(GM)
2.-	+	Material C	(Sh)

BORE HOLE LOGS

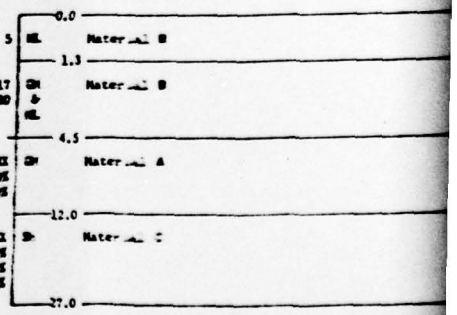
BH [illegible], C/L, Elev. 1238.2



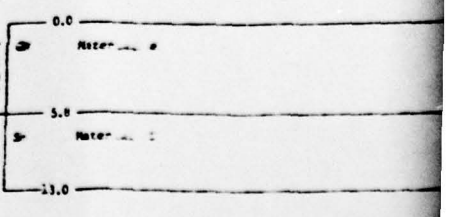
BH 52, C/L, Elev. 1240.1



BH 53, C/L, Elev. [illegible].1



BH 54, C/L, Elev. [illegible].1



DRILL HOLE LOGS

Elev. 1230.2

ial A

ial C

ial B

ial A

ial C

ons of drill water at 7.0', return at
1.0' moderate water loss from 29.0' to 31.0'.

Elev. 1241.1

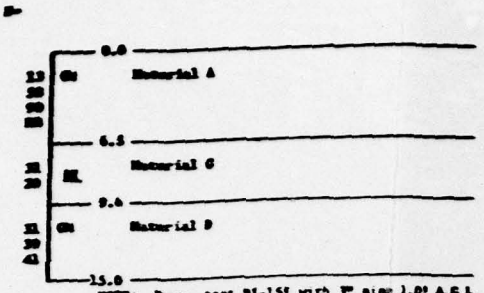
ial A

ial C

water loss from 4.0' to 10.0'.

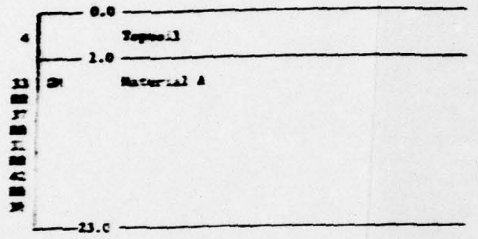
Elev. 1231.1

DH 11, C/L (Emergency), Elev. 1230.1

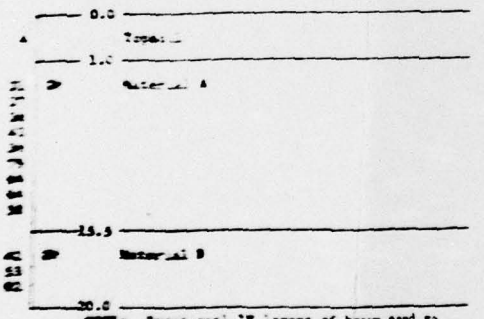


NOTE: Perm. test 9'-15' with 3" pipe 1.0' A.G.L. Level dropped 0.2' in 3 min.

DH 151, Borrow, Elev. 1264.1

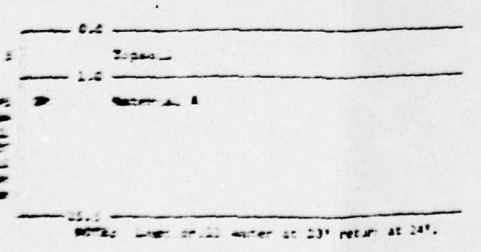


DH 251, Emer. Spillw., Elev. 1264.4



NOTE: Occasional 2" layers of brown sand or silt were observed in bottom 2' of this hole.

DH 351, Emer. Spillw., Elev. 1244.2



NOTE: Water [illegible] water at 23' return at 24'.

KEY TO SOIL CLASSIFICATION CHART

- GW Well graded gravels; gravel-sand mixtures
- GP Poorly graded gravels
- GM Silty gravels; gravel-sand-silt mixtures
- GC Clayey gravels; gravel-sand-clay mixtures
- SW Well graded sands; sand-gravel mixtures
- SP Poorly graded sands
- SM Silty sands; sand-silt mixtures
- SC Clayey sands; sand-clay mixtures
- ML Silts; silty, or fine sands; sandy or clayey silts
- CL Clays of low to medium plasticity; silty, sandy or gravelly clays
- CH Clays of high plasticity fat clays
- MH Elastic silts; micaceous or diatomaceous silts
- OL Organic silts and organic silty clays of low plasticity
- OH Organic clays or silts of medium to high plasticity

BEDROCK SYMBOLS

B	Basalt	Sh	Schist
Co	Conglom	Sh	Shale
G	Granite	Si	Siltstone
Ls	Limestone	Sl	Slate
Ma	Marble	Ss	Sandstone

NOTES

- DS Disturbed
- US Undisturbed
- Core DX Core

KEY TO BORE HOLE (CH) LOGS

- 8 / 22 — Number of blows required for 1-ft. standard penetration, using 2.0" O.D. split barrel sampler, 140 lb. hammer, and 30" drop. ASTM D 1586.
- 9.0 Depth in hole (ft.)
- CL Unified Soil Classification Symbol
- 12.0
- D.B.S. — Dry barrel sampler
- RB — Roller bit to advance hole by wash boring
- 17.0 Depth in hole
- RC — Rock core, 2-1/8" diameter
- 75% — Percent rock core recovery in each drill run
- 50%
- 90%
- Ls Bedrock symbol
- ▽ 16 (date) Water Level

NANTICOKE CREEK WATERSHED PROJECT
SITE 8
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Logged B.S. ELLIS	Date	Approved	Title
B.J.G.	2/67	Sheet 15 of 16	NY-2006-P